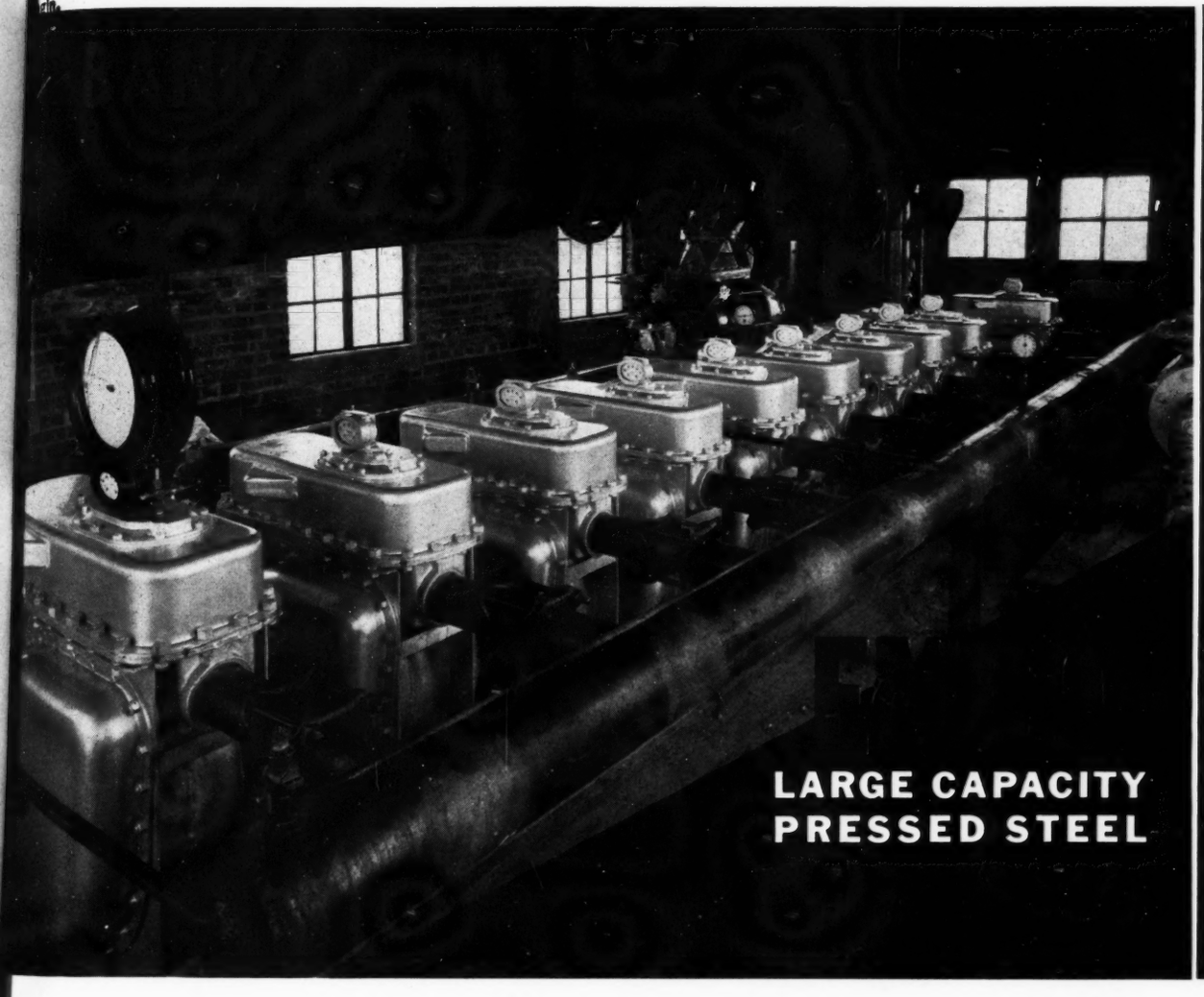
GAS

ENGINEERING • UTILIZATION • LOAD-BUILDING • MANAGEMENT



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EMCO NO. 4½
PRESSED STEEL METER
WITH EMCORECTOR

EMCO NO. 5
PRESSED STEEL METER

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PITTSBURGH EQUITABLE METER COMPANY

MERCO NORDSTROM VALVE COMPANY
Main Offices, Pittsburgh, Pa.

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DOWN THE STRETCH AGAINST TIME

To Speed National Defense

Thousands of miles of pipe lines form a vast network of steel across America. Millions of gallons of oil and gasoline—millions of cubic feet of gas—are transported from well to plant, from plant to plant and from both well and plant to point of use.

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PRESIDENT

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LINE PIPE NORMALIZED CASING AND TUBING

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SKINNER-SEAL BELL JOINT CLAMPS stop bell and spigot joint leaks under pressure — offer a quick, economical way of making lasting repairs.

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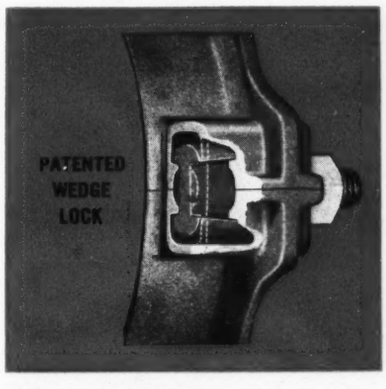
Clamp adjusts automatically to all normal variations in pipe sizes—cuts down the stock of clamps in your store room. Write today for the big illustrated Skinner Catalog No. 41.

SKINNER-SEAL BELL JOINT CLAMPS



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Seventeenth Year of Publication

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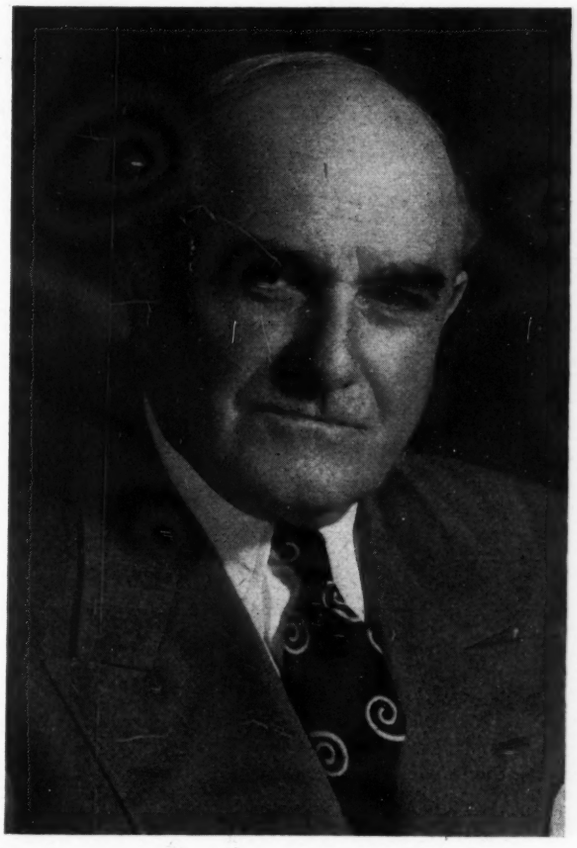
GAS
DECEMBER, 1941

GUEST Editorial

THE EXECUTIVE'S JOB in the "COMBINATION UTILITY"



By BRITTON I. BUDD
President,
Public Service Company of Northern Illinois
Chicago, Illinois

THE job of the executive has never been static. This is certainly true under today's conditions, and the executive who has the responsibility of directing a combined gas and electric utility must follow a distinct administrative course in order to do justice to both operations.

A thorough study of the gas and electric functions of our business extending over many years leads to the conclusion that each utility should be operated along the line that will be most advantageous, all things considered, to its own development. This is true not only in the interest of the utility, but of its customers as well. Such a policy, moreover, does not work to the disadvantage of either utility.

The application of this principle to the Public Service Company of Northern Illinois, which conducts a gas and electric business in the suburban area surrounding the city of Chicago and in the northeast portion of Illinois, serving some 337,500 electric and 174,000 gas customers, resulted several years ago in our establishing some organization alignments which differed from those usually found within the so-called "combination company."

Basically, the changes were directed at separating those combined gas and electric activities which studies had indicated could be most logically carried on as separate utility functions. Accordingly, such items as gas sales (including merchandise sales, commercial sales, and industrial sales); gas operating and construction work; and customers' field service work, together with certain other correlated activities such as transportation and storekeeping, were segregated and carried on as direct gas activities under separate supervision, subject only to general executive coordination necessary for good public and customer relations.

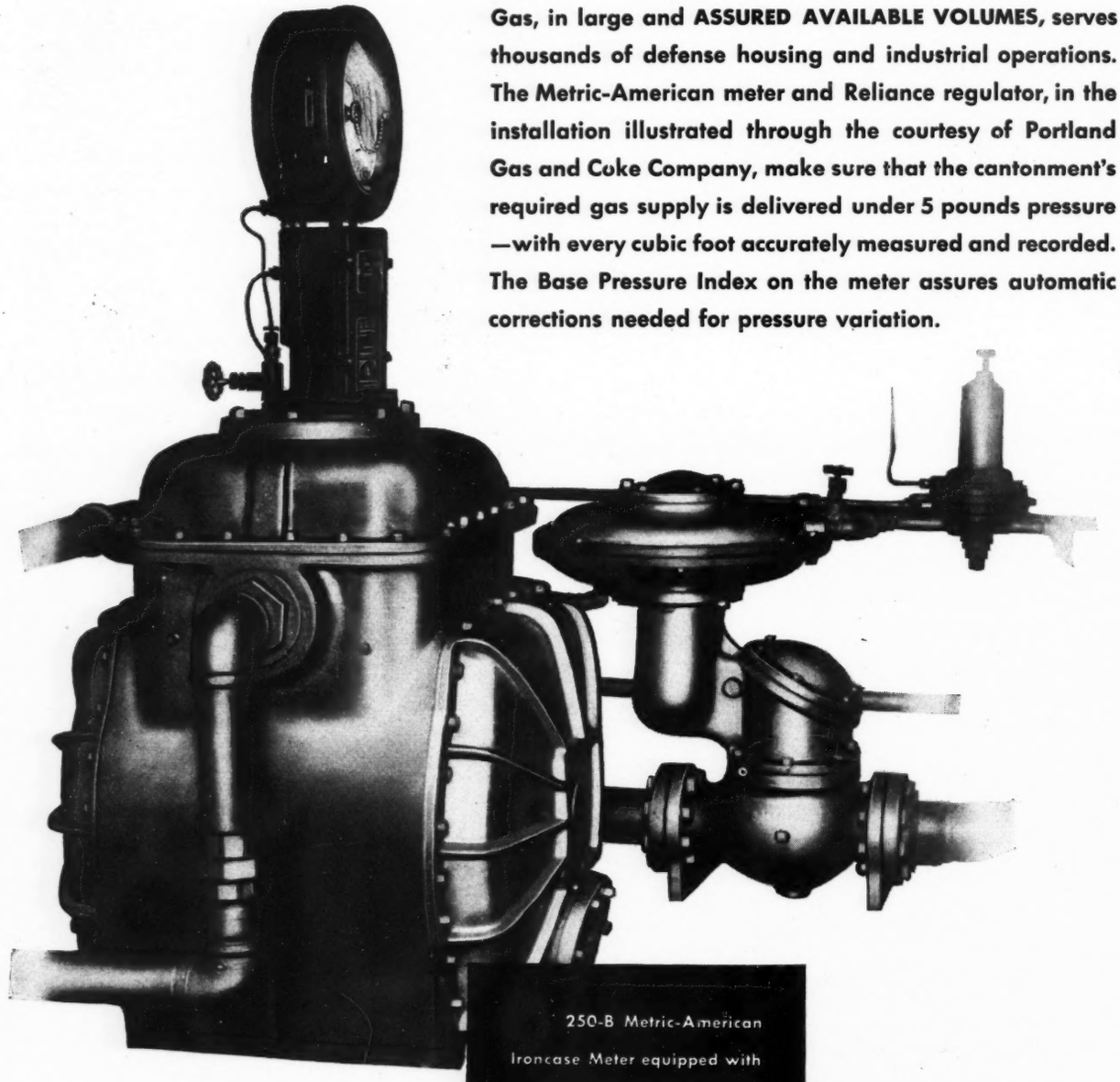
The effect of this program can best be illustrated from the results obtained from one of the activities—that of sales promotion. For years the combination merchandise salesman sold both electric and gas appliances, favoring one or the other depending to some degree on his individual preference. Gas merchandise sales in dollar volume under those conditions represented about one-eighth of the combined electric and gas total. After the separation, where the individual salesman sold only electric or only gas items of merchandise, the gas sales increased to the point where they now represent one-quarter of the total, or double the former ratio. This marked increase in the gas sales showing has been made in the face of a healthy increase in electric sales. This was true not only immediately following the change, but an analysis of the average over a three-year period prior and subsequent to the separation showed a similar relationship. The establishment of separate salesrooms for gas and electric merchandise, considered as a rather bold move by some people, has likewise proved beneficial to both utilities.

The other activities that were separated, both electric and gas, have shown comparable results and have led to the establishment of well-defined and satisfactory spheres of authority in the operation of each utility. Collateral advantages of great value to the company have followed—not the least of which has been the improvement in employee spirit and morale, particularly in the gas utility.

...at 29th Engineers Cantonment

gas fuel bin of national defense

Gas, in large and ASSURED AVAILABLE VOLUMES, serves thousands of defense housing and industrial operations. The Metric-American meter and Reliance regulator, in the installation illustrated through the courtesy of Portland Gas and Coke Company, make sure that the cantonment's required gas supply is delivered under 5 pounds pressure —with every cubic foot accurately measured and recorded. The Base Pressure Index on the meter assures automatic corrections needed for pressure variation.



250-B Metric-American Ironcase Meter equipped with a Base Pressure Index, and a Reliance CBV Regulator, at 29th Engineers Cantonment. Installed by Portland Gas & Coke Company.

AMERICAN METER COMPANY
INCORPORATED (ESTABLISHED 1836)
METRIC METAL WORKS • ERIE, PA.

Reliance Regulator Corporation
ALHAMBRA CALIFORNIA

1741

THERMALLY *Thinking*

Gas Coordination

WITHOUT reservations, we commend the action of Petroleum Coordinator Harold L. Ickes in creating the new natural gas and natural gasoline section of the OPC, with Paul Raigorodsky as Assistant Director of Production in charge of Natural Gas. And without exception we applaud the selection of the individuals named to act as regional chiefs of the five coordination districts.

The selection of Mr. Raigorodsky, and his immediate appointment of Thomas R. Weymouth to the post of natural gas consultant, insures the industry that the interests of natural gas will be made secondary only to national defense by those in the key positions during the uncertain times that lie ahead.

We know that it has long been a popular pastime around the glass topped directors' tables to rail at the fancied intrusion of Secretary Ickes into the affairs of the oil and gas industry. His methods are simple, direct and sometimes blunt to the point of brutality. Yet he has made it an established principle of his office and a governing rule for his subordinates, that no industry and no factor within an industry shall be permitted to use the emergency to gain a competitive advantage over another.

Considering the brazen and blatant attempts of the coal interests and their railroad henchmen to make capital of the emergency at the expense of both gas and oil, it is a source of great confidence to know that neither their past intrigues nor their future machinations are to go unchallenged.

Through his policy of enlisting first of all the cooperation of everyone in an industry who is willing to cooperate, Mr. Ickes has built in the Office of the Petroleum Coordinator one of the most logically organized agencies in the entire defense program. His early selection of Ralph K. Davies, vice president of the Standard Oil Company of California, for the post of Deputy Coordinator, was a source of gratification, and possibly of relief, to the oil industry. In this appointment oil men saw established the principle of using industry's top flight ability to coordinate its collective responsibility. The organization of the Natural Gas section under Paul Raigorodsky is a consistent, and we believe, an eminently satisfactory extension of that principle.

We conceive it our duty to the defense program, and our obligation to the entire natural gas industry to pledge our fullest support and cooperation to the work of this new agency in behalf of natural gas coordination.

■ ■

Pass the Gas Mask

IF you want your enthusiasm for gas to suffer a momentary relapse we recommend that you spend a little more time than is necessary in the tailor shop the next time you leave a suit to be pressed. Coming out of the modest establishment of our own tailor, whose name is a complicated Greek assortment of consonants, we decided to look into the reasons for the amazing and almost lethalizing blending of objectionable odors that had assailed our nostrils and numbed our normally alert and vigorous mental processes.

So it comes out that while the New York State health code requires that pressing boilers be vented, venting consists in most instances only of poking the end of a pipe out through a window, where down draft and cross currents whirl busily about daring the products of combustion to make their escape. At least half a dozen other states have taken the same careless attitude toward venting, and the attitude of the gas companies has been to lay low and say nothing lest they disturb the semi-coma of some of their small commercial gas customers.

Either an exhaust fan, or an adequate vent to the roof would correct this condition, and do it at a trifling expense compared to the danger to health and safety of the operators that the present condition invites.

The manufacturers of small boilers have conveniently closed their eyes to a condition within their own ranks that lies within their power to remedy. For despite the fact that there has been in existence for over five years an A.G.A. laboratory code for pressing boilers, not one of the half dozen makers of these boilers has submitted a single model for approval.

The contention of manufacturers has been that the volume of business in these small models is not sufficient to justify the expense of having them tested by the laboratory. This seems a dubious explanation, but if it is borne out by the facts, it would appear that it would be well worth while, from a public relations standpoint, for the gas industry through the American Gas Association to partially subsidize the tests. Manufacturers who are sincerely desirous of placing an approved appliance on the market would, of course, agree to make any changes in design that the laboratory findings would indicate.

The gas companies, for their part, should refuse longer to ignore the inadequacy of state and local laws that permit faulty venting. Every gas installation can, and should be a working advertisement for the fuel it uses. Right now, in the average tailoring establishment it awakens in the public's mind nothing more inspiring than a stifling premonition of the pulmotor.

■ ■

Advertising's Opportunity

WE get around a little, and it has seemed to us lately that our friends in the Advertising Manager spots with the public utilities are beginning to wear something of a hunted look. They have courageously laid out next year's budgets, and in the main most of them have had them approved without serious curtailment over the efforts of previous years. But as that old devil deadline begins to leer at them from behind the typewriter they are stricken with the cold realization that the stock approaches of yesterday

lack conviction in a world at war, and they wonder, frankly what they are going to talk about.

Everyone who has read any of the pocket textbooks knows that advertising serves at least two major functions, one of which is to persuade, or sell something; the other function, equally important, although often neglected, is to inform, or tell something. In the main, gas company advertising has justified its existence on the fact that it has been doing what is called a selling job. More ranges, more water heaters, more furnaces and a greater load has been the record on which company advertising policy has often stood or fallen.

It is true that some so-called institutional campaigns have been run, but these too often have been little more than thinly disguised propaganda to the effect that the tax burdens are something terrific—a matter of monumental unconcern to the customers—or meandering expressions of love and affection for the public that the public in general welcomes about as much as it does the vagrant friendliness of a stray cat.

Advertising has a function more noble than that of wheedling and cajoling and we are firmly of the opinion that in the year that lies ahead will be the golden opportunity to display it. The culinary cut-ups who gather around a new gas range with their boy friends for a four-color photo of American family life in its fullest flowering can be allowed to relax their frozen features; and the "now you too can have" copy approach won't carry conviction if you have to add "provided you can get Application for Preference Rating, (Form PD 105b) approved by the OPM."

We believe that with all of its shortcomings, the *selling* type of copy has done a commendable job for the industry, and that the time will come when it will again be the accepted and the desirable thing. We are equally persuaded that now is the time for *telling* copy —copy couched in terms of the vital message that every industry must relay to the consuming public if it hopes to maintain its place in the new order that is upon us.

Perhaps the little bell that rings when the cake is done can no longer be dangled before the eyes of a gadget loving public; but the tremendous bulwark of safety and security that lies locked in our natural gas reserves, or flows through the fuel arteries of the nation can be dramatized as it has never been adequately dramatized by any advertising pen.

The subtle implication that anything older than last year's model is behind the times may have to be abandoned in favor of an honest and forthright offer on the part of the gas companies to inspect, service and rehabilitate appliances so that their remaining years usefulness may not be at the expense of a precious fuel urgently needed for sterner tasks.

As necessity again stimulates the latent genius of invention, those new contributions and new products that are developed for or through the use of gas can be presented as the industry's entries in the vanguard of progress.

The avowed objective of the titanic struggle to which we are reluctantly turning is the building of a better and a more secure nation in an enlightened and peaceful world. The gas industry is rising in nobility and competence to perform its appointed function. It is the responsibility of advertising to see to it that the saga of its achievement shall never go unsung.

■ ■

Standardize Now

LIKE rain on a tin roof, these days, come those little notes from manufacturers advising that this number, or that model or the following items in their line of gas appliances or equipment are being discontinued. We do not subscribe to the gloomy belief, current in some quarters, that it is just a question of time until all of the comforts and conveniences of civilian consumption are choked off at the source.

But we do believe that when, and as, the now critical materials are again released in limited allocations for normal manufacturing processes, they will have to be used frugally and fabricated to the best advantage. This need work no hardship on the industry any greater than the personal pain that sometimes attends the banishing of a pet idea regarding equipment. Greater standardization will result, and standardization is a desirable goal that the entire industry has often applauded.

Too much diversity in models, styles, sizes and makes can be mainly attributed to two causes. Manufacturers have been prone to make changes and release new lines in both appliances and equipment merely because their salesmen needed "something new to talk about." Couched in the terms of selling, every innovation was a revolutionary improvement, and every novelty filled a long felt want.

Utility sales executives as well as gas engineers, on the other hand, have often put pressure on manufacturers to bring out new models in appliances, or to make non-essential changes in the design of equipment to serve the imaginary requirements of a limited territory, or to facilitate the continuance of some non-standard local distribution or installation practice.

Speaking before a group of gas company representatives some months ago, Willard F. Rockwell of the Pittsburg Equitable Meter Co., gave it as his opinion that manufacturers could reduce prices at least 10% if some measure of cooperative standardization were adopted, and "elimination of certain fittings, connections and other parts might cut the number of types by 50%, which automatically would double the quantities of production of the remaining types."

Since these cogent observations were made by Col. Rockwell the price factor has receded into the background, under the press of more and more urgent demands for materials, and less and less raw stock from which to manufacture them. Obviously, every pound of brass, copper, aluminum or other critical metal that is tied up in inventories of unnecessary models reduces by just that much the usefulness of the limited supplies available.

As the defense effort continues, some semblance of order may be expected to come out of the official chaos that now reigns in Washington. And mature reflection on the part of even the most military minded will reveal the wisdom of allocating supplies for essential civilian requirements, we are confident.

We believe that the gas industry can best establish its right to a fair share of these supplies by advance evidence of its determination to use them to the best advantage. Standardization now, cooperatively undertaken and accepted by both manufacturers and gas utilities, is the first and most essential step.

■ ■

Priority Perplexities

THE Priorities Division of OPM, on November 3, amended the Copper Conservation Order No. M-9-c, a number of changes, largely for clarification, being made in the Order.

Of greatest interest to the gas industry was the fact that the amendment has been interpreted to mean that the manufacturer may continue to use copper in heat controls and valves under 2-in. in size. The amounts which can be used, of course, are limited by the provisions of M-9-c.

While these amendments will have a favorable affect upon the manufacture of gas appliances and may assure to some extent a future supply of appliances, it is certain that 1942 will bring further curtailments in production and no one knows what restrictions on critical materials. The ma-

terials problem is far from solved and new plans are now being formed in Washington.

Latest variations in the priorities set-up is the Production Requirements Plan, (supplanting Defense Supplies Rating Plan) to be in operation by January 1. This new plan is designed to aid defense and essential non-defense production by insuring a wide share of industry needed critical materials for a three-months' period. The plan would operate first on a company basis, but would be applied on an industry basis as soon as practicable.

The same priority rating would be granted for the materials needed to manufacture a product as is in effect for the product itself. Three factors will govern OPM's Priority Division in determining what priority to grant an applicant. (1) The amount of defense or essential civilian production involved; (2) the end use of the products; (3) the materials required for production. Ratings under PRP may apply to all or any specified part of a manufacturer's requirements.

Men with a critical eye to the future say that the priorities system is breaking down and that further shake-ups are due in the defense set-up, the trend being toward a civilian ministry of supply with even greater centralization of power. The production Requirements Plan will form the bridge from priorities to allocations. Setting up the proposed system of allocations, however, is a Gargantuan task, and the change will come only through group pressure on Congress.

Business men are warned to keep alert to the changing materials situation in Washington. Further information on the Production Requirements Plan may be obtained by writing OPM. The new form to be filled out is PD-25A. The Administrator of the Copper Order is A. S. Hewitt, Priorities Division, OPM., Social Security Bldg., Washington, D. C.

■ ■

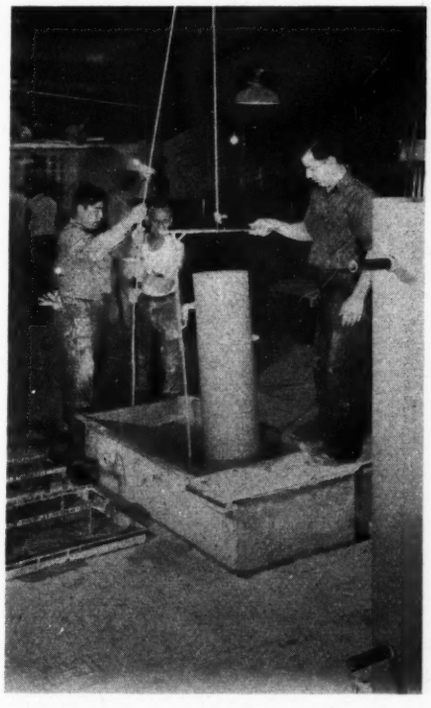
Porcelain Enamel Tanks

PORCELAIN enamel, for centuries highly regarded for its serviceability and beauty, is, due to the national defense program, playing an increasingly important role in modern living.

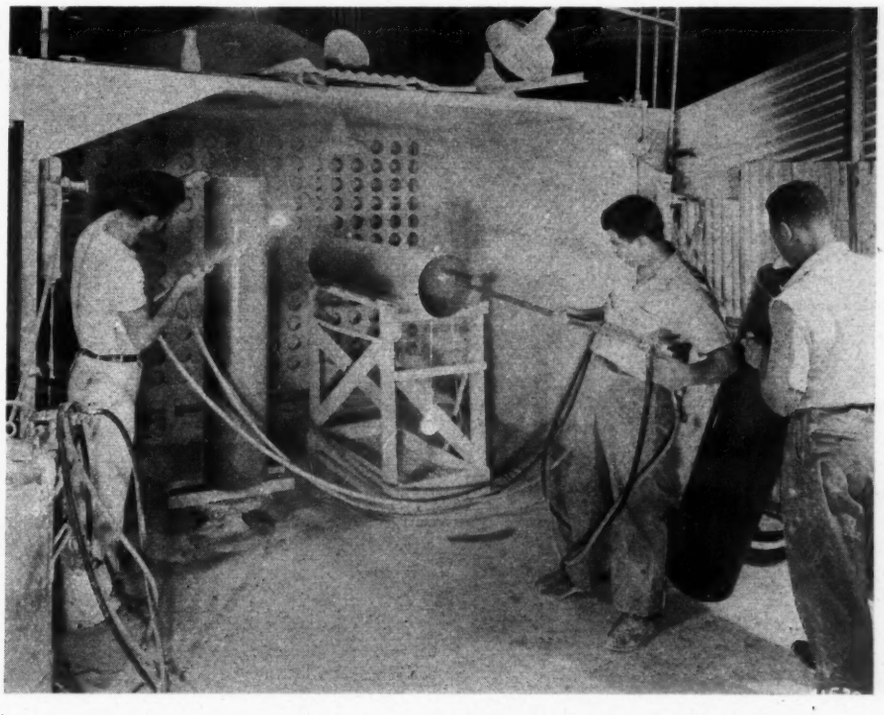
Porcelain enamel cooking utensils, refrigerators and ranges are everyday household articles. Something new is the swing to porcelain enamel hot water tanks and range boilers, now becoming increasingly important because of restrictions on zinc and copper. At present, six companies are engaged in the manufacture of porcelain enamel tanks, and other manufacturers are contemplating entering the field.

One of these manufacturers, the Hotstream Heater Co. of Cleveland, announced its new liquefied petroleum gas porcelain enamel automatic water heater with an advertisement in the December issue of *Butane-Propane News*.

The photographs below show two steps in the manufacture of a porcelain enamel hot water tank at the plant of Porcelain Steels, Inc., at Cleveland, Ohio. Armco Enameling Iron, made by the American Rolling Mill Co., of Middletown, Ohio, is used exclusively. After the tanks have been rolled, welded, scarfed both inside and out, holes are punched in the cylinder shell in making flanges on which the hand-made spuds may be welded. After the spuds are welded to the tank shell, the cylinder goes to the enameling plant and is immersed in acid and boiler cleaner to remove grease, dirt, rust and scale. The first photo shows a device used to hold the tank while it is being dipped in the ground coat of enamel. After dipping the cylinder is placed in the drier seen in the background. Narrow edges around both ends are brushed to provide an area of bare metal for welding on the heads and the cylinder is fired. The second photograph shows the application of the finished coat of enamel. After the tank is enameled, a strip of glass cloth is placed between the tank shell and the heads as the



In its Cleveland plant, Porcelain Steels, Inc., is now manufacturing porcelain enamel hot water tanks. Armco enameling iron, made by American Rolling Mill Co., is used. A simple device holds the tank while it is dipped into the ground coat of enamel.



Here the finish coat of enamel is sprayed on. Edges again are brushed to remove enamel and provide an area for welding after assembling. Meanwhile the tank heads have been given a ground coat of enamel, edgebrushed, fired, sprayed, edgebrushed and fired again. Soft non-corrosive metal is cast into the spud channels after the porcelain enameling is done. The soft metal is tapped and threaded to provide a water-tight seal for pipe connections. (Photographs courtesy of American Rolling Mill Co.)

heads are inserted in the shell. A welding operation fuses the glass cloth, making a water tight joint inside the tank, and the tanks are tested by water under pressure.

Tanks with vitreous coated interiors replacing galvanized sheet metal have been on the market over a year. Production of such tanks was undertaken jointly some three years ago by Sears, Roebuck and Co. and A. O. Smith Corp. Their new product sells for about 20% or about $10.00 above the old type, but it is thought that production costs and selling prices will level downward as the manufacturing processes are perfected.

■ ■

The Gas Range—1942

A GOOD guess is that the volume of gas ranges which will be manufactured in 1942 will approximate the 1940 production. This curtailment over 1941 should not seriously hamper gas range manufacturers, as 1940 is listed as a good sales year. and they will no doubt alllot to utilities and dealers in ratio to their 1940 sales. Of course, national defense comes first, and this means a decrease in the number of models produced in 1941 and the elimination of new models for 1942.

Restrictions on materials will necessitate simplification in design. The first step in this direction towards saving manufacturers costs and valuable materials and labor was proffered last month by Leon Henderson, Administrator of the Office of Price Administration, and the Division of Civilian Supply Office of OPM, who have requested that manufacturers of domestic cooking ranges discontinue the use of cover tops by December 15, or as soon before that time as their parts in process can be utilized. This simplification measure was approved by OPM's cooking and heating advisory panel at its October 24 meeting.

In spite of 1942 curtailment, the gas industry may find that it still has a selling job to do. With increased taxes taking larger chunks from the consumers bankroll and the end of speculative buildings in 1942, the utility and dealer will find that his largest market lies in the defense housing territories and in replacements. This will mean that advertising and promotional activities will be as important in 1942 as they were in 1940,, the year upon which next year's allotment is to be based. Concerning prices OPM has asked the cooking and heating industry not to increase prices on their products above the level prevailing on October 24.

Sales in Canada

IN Canada the conversion from a normal to a war-time economy is nearing completion. Taxes have increased 300%, the cost living 11%. A price control law, including the regulation of wages, has been passed in an effort to stop this upward trend. About 40% of its national income is spent for war—more than $2,000,000,000 during the present fiscal year. In proportion, the United States would have to spend $35,000,000,000 per year to equal the Canadian effort.

Against this background, sales statistics issued by the Gas Division of British Columbia Electric Railway Co. for the months of August and September reveal that 334 gas ranges were sold. These figures are slightly in excess of those for the corresponding months of 1940, a phenomenal achievement in view of difficulty in delivery of range stocks to the dealers and of government restrictions on installment sales.

The latest development on the Canadian sales front has been the announcement of British Columbia Electric Railway Co. through its president, W. G. Murrin, of the abandonment of an aggressive policy of encouragement and cooperation with range dealers in order to follow the clearly expressed wishes of the government and to remove any false stimulation of the market, and to thereby relieve the demand on manufacturing plants, thus permitting them to turn more attention to war industries. Among the concessions granted to consumers, cooperating retail outlets, and salesmen which have now been cancelled are the following:

1. The free piping allowance on gas ranges which ran up to $16, depending on the type of range. A consumer who is building a new home and who purchases a gas range for the home prior to the end of this year, has until September, 1942, to take advantage of the gas piping concession.

2. Free trade-in allowances made by the gas company to dealers and valued at $10. $15, and $20, according to the type of range.

3. Advertising allowances running up to $5 per range sold and $1 on refrigerators.

4. Transfer allowance granted a consumer who has used a gas range for a number of years and who is moving to a new house.

5. The special price on automatic gas water heater tanks sold in conjunction with gas ranges. The retail plan on gas water automatic storage heaters, however, will continue as long as existing stocks are available.

All of these cancellations became effective at the end of December, 1941, and dealers have been asked to complete their returns to British Columbia Electric Railway by January 15, in order that allowances now in effect can be recognized.

The cancellation of concessions applies to both company salescrews and cooperating dealer organizations. All prospect bonuses have also been cancelled. While dealers will from now on have to finance their sales privately, the gas company will continue to finance gas piping installations as these are not acceptable by ordinary finance companies on the usual standard terms of one-third down, as stipulated by the War Times Prices & Trades Board.

British Columbia Electric will continue to accumulate information on appliances sold by requesting dealers to continue their present policy of sending in monthly sales reports, an allowance of $1 being paid for each such report received.

Looking forward to the end of the war and the return of normal business practices, the Vancouver utility will maintain its dealer cooperation department and will seek to work in closest harmony with dealers in solving their problems. Its advertising program will not be discontinued, but the stress from now on will be institutional and educational rather than on merchandising. The home service and dietetic departments will be continued on a service rather than on a promotional basis.

While all merchandising and special campaigns in the realm of domestic appliances have been cancelled for the duration, the company's industrial gas division is more active than ever, and many new types of installations involving considerable ingenuity and designing ability are being completed for war industries.

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"Surplus" Sales

THE Railroad Commission of the State of California, in view of the great increase in demand for gas service during the present year from all classifications of consumers, has, upon its own motion, conducted an investigation into the "surplus" gas situation in that state. While there is not now nor has there been a shortage of natural gas for distribution to the "firm" load, a critical situation has arisen in connection with the usual cutting off of surplus gas users—many of them industries engaged in defense work—during winter peak periods in favor of the "firm" load.

In years past, industries receiving such surplus gas service during peak periods, did one of three things: (1) provided themselves with stand-by fuel; (2) provided for essential needs

by buying some gas at "firm" rates; (3) gambled that the winter would be mild, and in the event of a shut-off closed down their plants.

This year, the fact that many of these industries are engaged in national defense work, has complicated the surplus gas situation in California. Many such industries, at the request of the California Railroad Commission, California State Council of Defense, and the California utilities, have provided themselves with stand-by fuel and are, therefore, prepared for the usual peak load shut-off of industry. Others have contracted for essential needs on a "firm" basis. Many industries, however, have done neither of these; claiming that as an industry engaged in defense work, they should receive "firm" service without contract or stand-by. Obviously, such procedure would discriminate grossly against those industries which have made expenditures necessary to care for their needs.

Hearings to determine the enforceability of shut-off provisions in industrial schedules were held in Los Angeles and San Francisco late in October. The findings have resulted in the issuance of an interim order, signed November 26, to become effective this month. The order not only aids the gas utilities in serving defense industries by placing greater emphasis on the use of standby fuels, but it also is designed to eliminate the possibility of rate discriminations between industrial consumers. The surplus gas situation in California is discussed in detail in an article by Roy A. Wehe, gas and electric engineer for the Commission on Page 16 of this issue.

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For the Eighth Time—No!

ON Tuesday, November 4, the people of San Francisco went to the polls to vote for the eighth time on whether or not the political powers of that city were to gain control of the electrical distribution facilities of the Pacific Gas & Electric Company. In spite of political pressure from high Washington officials favoring passage of the power bonds, the measure went down by a 2 to 1 count, a blow to municipal tax-free ownership and a tribute to P. G. and E.'s long record of efficient service and rate reductions.

Next step in the long drawn fight for Hetch Hetchy power will be an attempt to amend the Raker Act under which the City of San Francisco built the Hetch Hetchy water and power plant, and which prohibits the city from selling its power to a private utility for resale (*GAS*, Sept., 1941, p. 19). Representative Thomas Rolph has introduced a bill to amend the Raker Act to permit San Francisco to dispose of Hetch Hetchy power legally. To aid in the campaign various civic organizations have appointed committees to go to Washington on behalf of the Rolph bill. Mayor Rossi has named a citizens committee, and the board of supervisors has adopted a resolution calling on California Senators and Congressmen to work for the bill.

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Defense Housing

OF particular interest to sales organization within the gas industry is a priority plan to aid construction of defense projects announced by Donald Nelson, Priorities Director of OPM, on September 19.

Under this plan builders may secure refrigerators, stoves, metals and other critical materials required for both new home construction and modernization. All critical materials needed for a building project in any one of the 388 "Defense Housing Areas" will be covered by one project preference rating. The private home builder will be given a project preference rating which he can extend to suppliers of material. OPM has approved this plan to cover 200,000 privately built defense homes for construction during ing the next six months.

The plan:

1. OPM has approved the construction of a minimum quota of privately built houses in defense areas. A list of critical materials has been issued but drastic changes in many building methods; some changes in former F.H.A. standards and local building codes may be required. Each community receives a special priority rating depending upon its importance to the defense effort. Ratings may vary from A-10 to A-2.

2. In order to qualify for priority assistance, the market price of a house must not exceed $6000 per family unit, or a rental value of $50 per month. The builder must certify that the houses are intended "primarily for defense workers and are available to, and suitable for them." Any modernization job which adds an additional housing unit will qualify and receive top rating.

3. F.H.A. and its field offices and staff will accept applications, disburse information and assist as liaison agency between the builder and OPM.

4. A brief procedure for a builder to follow in securing a project preference rating follows:

(a) Obtain Application Form PD-105 and Documentation Sheets PD-105a (new houses) or PD-105b (modernization) from nearest F.H.A. office or local F.H.A. financing institution.

(b) Fill in forms (six copies of each) and attach one set of drawings, specifications, plot plan. Check with local F.H.A. official and have notarized.

(c) Complete information and necessary forms are easily obtained through F.H.A. offices—use this assistance.

This is the type of business which is particularly attractive to both manufacturers and utilities, and one which should receive special attention from sales organizations. Copies of printed matter and more complete information may be obtained through local F.H.A. offices.

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Progress at Permanente

THINGS are popping in Permanente, Calif., where the chemical engineering division of the Todd-California Shipbuilding Corp., of San Jose, Calif., is operating a plant to transform calcined magnesite into metallic magnesium.

1. The name of the company is being changed to The Permanente Metals Corp., which is not to be confused with The Permanente Corp., an affiliate which produces cement.

2. By January 1 the daily production is expected to reach 12 tons of metallic magnesium.

3. A second 4000-ton a year plant is now being constructed at Permanente.

4. Reconstruction Finance officials announced November 15 that a new $11,000,000 loan had been offered to finance construction of third, fourth, fifth and sixth units. This is in addition to an original $10,000,000 loan made to Henry J. Kaiser, builder and operator of the plant.

5. The corporation is exploring ore resources to supplement those at Luning, Nev., the present source of supply.

6. Dr. F. J. Hansgirg, who introduced the process into this country, is contemplating several changes in methods which will effect the amount of natural gas used.

Dr. Hansgirg's process, when used abroad, employed hydrogen as a cooling agent. At the Permanente plant, natural gas is being used for the first time for this purpose. The reduction of magnesium oxide to magnesium is accomplished in an electric resistant furnace at 2000° C., but little metallic magnesium results unless the material is suddenly cooled. Natural gas, which is this chilling agent, is then used as a fuel by the adjacent cement plant of the Permanente Corp.

Through loans made by Jesse Jones, Reconstruction Finance Corp. chairman, the Government has brought about the production of 310,000,000 lbs. of new metal a year and has thus far expended $177,000,000 in the magnesium expansion program.

California's "Surplus" Gas Situation

By ROY A. WEHE

Gas and Electric Engineer, Railroad Commission of the State of California

INITIAL hearings into the surplus natural gas situation in California (Case No. 4591) were held by the California Railroad Commission in Los Angeles on October 24, 27 and 28 and in San Francisco on October 30 and 31. The above named case is an investigation on the Commission's own motion and is being heard by Commissioners Riley and Sachse.

It undoubtedly may be said that the investigation is the logical outgrowth of the changing conditions respecting the availability of surplus gas in this State and its use as actuated by the rearmanent program. A short time before the issuance of the order of investigation, three of the southern gas utilities (Southern California, Southern Counties and Santa Maria Gas Companies) filed formal applications requesting greater control over the curtailment of surplus gas sales when physical conditions permitted keeping the gas in the ground, in the interest of conservation, even though line facilities permitted the handling of the extra surplus load. The Commission's own case was for the purpose of broadening the scope of the study in order to include all of the State, not only in reference to surplus sales but also as to the gas reserves, their availability and markets. This also permitted the full cooperation with the Department of Natural Resources, which latter department has control both of gas and of oil at the wells.

In the news release issued March 13 of this year, the Railroad Commission had this to say, in part:

"In order to make a sound determination of the pending applications, the Railroad Commission requires a thorough knowledge of the natural gas situation throughout California. Jurisdiction over these matters lies partly with the Railroad Commission and partly with the State Department of Natural Resources. That Department urges such an investigation be made and has indicated it will fully cooperate with the Commission. The two State agencies will expect the assistance and cooperation of all gas utilities, gas and oil producers and casing-head gasoline operators.

"The public interest demands that a long-range plan promptly be developed for the orderly distribution and utilization of the resources of natural gas in California available to the public utility gas companies operating in this State. Complete information of the present reserves, transmission and distribution facilities is essential before reaching conclusions as to any steps which may properly be taken to further proper and efficient use at fair and reasonable rates to the public consistent with conservation of natural gas. For the purpose of obtaining such basic data all interested parties are being called upon to cooperate with the appropriate agencies of the State of California in the obtaining of such information."

This study is now well under way. (1)

The Railroad Commission is also cooperating fully with the State Council of Defense and as a result a fairly comprehensive report, though preliminary in form, was issued to the Council the last of June on the natural gas situation in California, particularly in reference to defense, both as to direct use by the military agencies and by the defense industries, segregated by geographical areas.

As the report to the State Council of Defense is of a confidential nature, direct reference to conditions found can not be here made, but it is significant that, as the Commission's staff's own study progressed, it became apparent that an early hearing in Case No. 4591 should be called to bring to the attention of all interested parties the fact that a large portion of the present surplus gas consumers, especially in Southern California, had no stand-by in the way of auxiliary fuel to protect themselves in the event that it was necessary to curtail or shut off surplus gas this coming heating season.

Commissioner Riley, who presided at the Los Angeles hearing, made it clear, in his opening statement, that the California Railroad Commission, in calling up Case No. 4591 at this time, was not taking any evidence on the three utility applications going to the question of gas conservation. It likewise was pointed out that but a limited phase of the Commission's own case was to be developed, as the purpose of the initial hearings was to attempt to meet the problem presented by surplus gas consumers, engaged in defense work, which had no stand-by and the industrial operations of which presumably should not be interrupted —the problem of securing an adequate fuel supply this coming heating season.

At the hearings rather extensive evidence was presented as to the natural gas supply, giving consideration both to the gas available in the fields and to the ability of the pipe lines to transport and deliver the gas to the centers of distribution. Pipe line systems in the State are interconnected. (2)

These lines not only constitute the necessary transmission facilities to bring gas from the fields but likewise

R. A. WEHE

WITH THE SIGNING on November 26 of the California Railroad Commission's interim order No. 4591 governing the use and distribution of "surplus" gas in California, the article herewith presented by Mr. Wehe attains further significance (See page 15). This order, which becomes effective this month, is designed to aid the gas industry in its service to defense industries during this period of great demand on the gas supplies available by all types of consumers.

In general this order makes it necessary for customers purchasing gas under "surplus" contracts to provide themselves with standby fuel facilities. Under the order, the California utilities are not allowed to expand their "surplus" gas sales to new customers or for new uses without the approval of the Railroad Commission, unless such customers shall have provided themselves with standby fuel. Further, should any "surplus" gas customer demand and obtain uninterrupted gas service after notice given by the utility that such service is to be shut off, the obligation of the utility to render further gas service under existing "surplus" gas schedules shall terminate. Renewal of such "surplus" gas service at "surplus" rates is then contingent upon the Commission's approval and upon the customer providing himself with a standby fuel supply.—Editor.

(1) E. F. McNaughton, director of the public utilities department of the commission, is in charge of the study, with Prof. John Dodge, professor of petroleum engineering, University of Southern California, being retained to make a study as to gas reserves and Roy A. Wehe, gas and electric engineer, and his assistants being assigned to carry out the study on pipe line capacities, utilization and markets.

(2) In the south gas is secured from three principal sections: the L. A. Basin, Coastal (principally Ventura) and San Joaquin Valley—Kettleman Hills being the most prominent field in this latter section. In the north the Valley fields again constitute the principal source of supply, though the large dry gas Rio Vista field is and will undoubtedly be of increasing importance.

provide the mediums for exchange of gas so that deficiencies and over-productions in different sections may be dealt with promptly—thus conserving gas and reducing costs. The estimates as to the available natural gas at load centers is summarized in Table No. 1.

Testimony was also introduced as to the probable load requirements, seggregated as between firm and surplus customer demands. (3)

The requirements for firm use were predicated upon the peak-day customer usage during the coldest day of record and adjusted for growth. Table No. 1 presents these peak-day requirements, with available gas, in thousands of cubic feet per 24-hour period.

From Table No. 1 may be seen that in the south there should be sufficient natural gas to carry the firm gas requirements. Though this is so, the spread between demand and supply may be wholly wiped out due to growth in use per customer, which has been difficult to evaluate in these times of rapid changes in customer distribution. It is therefore plain that during periods of high heating demands there will be but little natural gas available for the surplus customers. The margin of supply over probable demands in San Diego likewise will be close inasmuch as the firm gas requirements will approximate the pipe line capacity of 24,000 M c.f. However, in both the Los Angeles and the San Diego areas large capacity stand-by, high B.t.u. diesel oil manufacturing gas plants are maintained in readiness to take care of emergency firm gas demands. Such capacities approximate 125,000 M c.f. per 24-hour period. Holder capacity in like amount is likewise available to provide principally for hourly fluctuations in gas demands.

On the Pacific Gas and Electric Co.'s system the figures presented for that portion labelled "Kettleman" do not look very favorable. However, it is believed there will be sufficient natural gas to meet all firm gas demands (barring line outages) inasmuch as some 50,000 M c.f. could be secured from Rio Vista under emergency conditions (4) as well as a possible increase in regular deliveries through the temporary opening of oil-gas wells, the production from which has been partially stopped under oil curtailment programs. As in the south, comparatively large manufacturing gas facilities are maintained for the demands of firm customers (in excess of 75,000 M c.f.) as well as a like holder capacity. These additional gas supplies relate basically to the supplying of firm gas needs under peak demands and emergencies. It is clear again that the customers buying gas under surplus contracts can expect and should be prepared to be shut off many times, and possibly for comparatively long periods (several days) during this coming winter season.

It is this class of consumer, namely, the surplus user, that the record shows the California Commission particularly to have been concerned over. For those customers who have provided auxiliary fuel supplies there is no problem. For those who have not and are engaged on vital defense production, there obviously is a serious problem—the problem of securing an uninterrupted fuel supply.

The utilities, the Commission and the State Council of Defense, early in the year, appreciated the mounting growth in firm gas requirements and the rapid shifting of the State's industries to the manufacture of war materials. A concerted drive was inaugurated by the utilities to educate their surplus gas customers to the customers' responsibilities and the necessity of providing adequate stand-by. This was productive of favorable results. The utilities not only sent out notices to each surplus customer but made personal calls on each to help ascertain his requirements and to urge adequate stand-by. At the hearings summary evidence was introduced showing the results of these surveys. Some of the more pertinent facts are set forth in Table No. 2.

From Table No. 2 it is seen there still remain, if the other changes are made, 877 customers using 20% of the surplus gas who will be subject to shut--off and will have no auxiliary fuel supply. The study showed that of this group 240 were engaged in defense work (as of October 1) and these 240 customers' week day surplus demands might approximate 14,000M c.f. per day. This, accordingly, should be viewed as the amount of unprotected surplus load that might require uninterrupted service and would have to be provided. It is also apparent that some of those customers who indicated changes would be made, if failing to do so, would cause additional demands.

In so far as surplus load is concerned, the San Diego situation offers so particular problem. The largest load of this character is the local utility's own electric generating plant use. This is fully protected by oil and, in fact, it is contemplated that oil operation will be required almost entirely during this heating season. Other surplus customer use is relatively small and all but a small amount is backed up by stand-by.

In northern California, on the Pacific Gas and Electric Co.'s system, a favorable stand-by situation is presented as the record shows that 865 out of 1067 surplus customers have an auxiliairy fuel supply; of the 202 that do not but 92 normally have operations

TABLE No. 1. ESTIMATES OF AVAILABLE NATURAL GAS AT LOAD CENTERS.

	*Greater L. A. Area Including San Diego**	*Greater San Francisco Area including Sacramento System†*	
		Kettleman	*Rio-Vista*
Estimated Available Natural Gas at Load Centers	525,000	250,000	180,000
Estimated Peak Requirements:			
Firm Load	504,000	294,000	88,000
Surplus:			
Transport	30,000	none	none
Steam plants	9,000	20,000	none
Industrial	125,000	101,000	32,000
Total Surplus	164,000	121,000	32,000
Total All Load	668,000	415,000	120,000

*This excludes what is known as the San Joaquin and Midway Divisions and also the area served by the Santa Maria Gas Co. It includes all of Los Angeles, Riverside and San Bernardino counties, except the city of Long Beach, which is municipally operated.

†This includes all the interconnected gas system of the Pacific Gas and Electric Co., exclusive of the San Joaquin Power Division. The Coast Counties Gas and Electric Co. likewise is excluded. This latter utility is comparatively small, with maximum peak-day requirements approaching 18,000 M c. f., of which some 3000 M c. f. is surplus and subject to curtailment. Facilities are adequate and gas supply is secured from the two principal transmission lines from Kettleman going north.

(3) In California, since the advent of natural gas service, there have been available, during the off-heating season (which is usually the greater portion of the year) large volumes of natural gas which have been sold on a dump basis and at such rates as could be commanded in competition with other fuels, such as oil. All such "surplus" gas is sold under contract subject to shut-off at any time the gas or pipe line facilities may be required to serve regular or firm gas customers. Surplus gas sales have ranged from 40% to 50% of all sales, and the average rate paid in 1940 was approximately 13¼¢ per M c. f. as compared to cover 60¢ for firm gas.

(4) At the present time pipe line limitations provide a barrier for large Rio Vista Gas deliveries into the Kettleman System, as well as rate regulations governing heating value. The heating value of the gas in the Rio Vista North Bay areas must fall within the 1000-1100 range, while that in the large San Francisco-East Bay-Kettleman area is 1100-1200 B. t. u. It is anticipated that changes may soon be made which will relieve both of these conditions.

TABLE No. 2. SURPLUS GAS CUSTOMERS.

Greater Los Angeles Area	*Number*	*Per Cent*	*Per Cent of Gas Used*
Customers With:			
100% Stand-by	291	20.0	60.0
Partial Stand-by	22	1.5	9.0
No Stand-by	1,153	78.5	31.0
	1,466	100.0	100.0
Customers with no Stand-by who indicated Stand-by would be Installed or Firm Gas Purchased:			
To Change	276		11.0
Remaining—No Stand-by	877		20.0
	1,153		31.0

that come during the heating season. The number engaged on all types of defense work is not disclosed. It is, however, reported that five do have government contracts and the present unprotected surplus of these may be as high as 5000 M c.f per day. It is believed that if continuous and prolonged shut-offs occur, many customers who have stand-by equipment will be without fuel because of their inadequate fuel storage facilities. Under such conditions and with more customers taking on defense contracts, the unprotected surplus demands might increase to nearly those in the southern part of the State.

In conclusion, it may be said that it now appears that if further curtailments of gas in the fields are not made there will be sufficient natural gas to provide for firm customer demands this winter in California. Surplus users can expect many shut-offs, occurring intermittently and lasting through February and even possibly March. The degree and extent will depend on heating demands as determined by weather conditions. It is imperative that all surplus customers abide strictly by the terms of their contracts and cease using gas when shut-off notices are received. All who have stand-by should use it under shut-off conditions.

For those defense customers, who are unprepared to carry out the terms of their contracts and who require uninterrupted service, ways and means undoubtedly will be worked out by the utilities and the Commission to see that gas is supplied, if that is the solution required. If gas is supplied during periods of shut-off, it is apparent that such service is no longer of a surplus nature and is not being delivered under the terms of the contract. If discrimination and preference are not to result between customers, then the new service must be paid for at appropriate rates.

Gas Institute Announces New Projects

AT a recent meeting, the Board of Trustees of the Institute of Gas Technology approved an "Outline of Proposed Research Organization" and certain policies relative to patents. With regard to research on basic prolems of the industry, the following projects are being started after careful consideration:

Project 1-41—Study of the phenomenon of adsorption, particularly with reference to specific qualities of the adsorbent. This project under the direction of Dr. R. C. Kintner.

Project 2-41—The application of catalysts to various reactions of hydrocarbon gases with intent to develop synthetic compounds from constituents of gas and its by-products. This project under the direction of Dr. V. I. Komarewsky.

Project 3-41—Instrument for automatically measuring and recording the dew point of a gas flowing at high pressure. This project under the direction of Dr. Max Jakob.

At present the faculty of the Institute of Gas Technology comprises the following:

Gas Chemistry: Associate Professor Robert C. Kintner, Professor Vasili I. Komarewsky.

Heat Transfer: Professor Max Jakob.

Catalysis: Professor Vasili I. Komarewsky.

Chemical Thermodynamics: Dr. Bruce Longtin.

Fluid Flow: Associate Professor Victor L. Streeter.

Advanced Mathematics: Assistant Professor John W. Calkin.

English, Technical Writing: Assistant Professor Sanford B. Meech.

In addition, Dr. Lincoln R. Thiesmeyer has been appointed Student Counselor and Geologist. Mr. P. J. Fitzpatrick, a chemical engineer, has been added to the research staff to assume general charge of the laboratory and to assist on Project 3-41.

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OPM and OPA Form Gas Industry Advisory Committee

FORMATION of a Plumbing and Heating Defense Committee has been announced by the Bureau of Clearance of Defense Industry Advisory Committees, Office of Production Management, Washington, D. C.

Of the 18 committee members, those affiliated with the gas industry are: H. M. Reed, president, American Radiator and Standard Sanitary Corp., New York, N. Y.; Frank C. Packer, assistant to president, Payne Furnace & Supply Co., Beverly Hills, Calif.; Harold Sweatt, president, Minneapolis - Honeywell Regulator Co., Minneapolis, Minn.; and N. H. Wiewell, assistant general sales manager, Jones-Laughlin Steel Co., Pittsburgh, Pa.

OPM has announced no official panel for cooking and heating stoves, although tentatively the heating stoves have been placed in the Plumbing and Heating Panel under L. H. Peebles. Cooking stoves are under M. Dinegar, who has been using the men selected on the official panel announced by the Office of Price Administration, as an advisory group. This panel, according to a letter from administrator Leon Henderson, will be composed of representatives from 30 manufacturers of cooking and heating stoves and ranges. Purpose of the panel is to supply from time to time, qualified advice on problems relating to price. To that end, committees will, as the occasion arises, be selected from the panel.

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Turner Valley Field Could Serve 500,000 Consumers

Sufficient natural gas to meet the domestic consumption requirements of a city of more than 500,000 people, is still being produced in Turner valley, Alberta, Canada, and the greater part is still, after more than 15 years of intensive operation, being burned in waste gas flares, according to the August report of the Alberta conservation board. The report showed a total valley gas production in that month of 3,997,015,000 cu. ft., or 128,936,000 cu. ft. daily, of which 94,723,000 cu. ft. were burned daily in waste gas flares.

The August Turner Valley gas yield of 3,997,015,000 cu. ft. was made up of 3,218,395,000 cu. ft. from 162 crude oil wells and 778,620,000 cu. ft. from 53 gas wells.

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Gas and Gas Appliances Cause Small Per cent of Fires

According to statistics released by the National Fire Protection Association covering the year 1940, fires during that year cost $290,000,000 and of that amount, only $1,800,000 or less than .50% of the damage was caused by gas or gas appliances.

Fires caused by smoking cost $18,000,000, or 14.6% of the total. Electricity and electric appliances were responsible for $26,300,000 worth of damage and 9.9% of the total.

CROSS-CURRENTS IN INDUSTRIAL RELATIONS

By GUY W. WADSWORTH, JR.

Vice President, Southern California Gas Co., Los Angeles, Calif.

DISCUSSION of current-day issues, whether economic, social, or international, is pretty much cut to a common pattern. The commentator, distinguished or otherwise, interprets where he dares not predict, or he predicts in a way which cannot be interpreted. If the issue is controversial, it is the fashion to present the case in such a manner that someone else, usually one who holds a view opposite to one's own, is made to appear unreasonable, insincere or wilfully committed to folly. We seem to care more about how things can be made to look than for analysis which justifies no particular viewpoint, but which might contribute towards solution of a problem.

In the field of employee relations we are particularly in need of less oratory and more solutions. The basic aspects of the labor problem have rarely been tackled with sleeves rolled up, at least in the intellectual sense. Managements have been prompt enough in recent years to do some "refiguring" from the accounting viewpoint to meet the demands forwarded in collective bargaining. The "house-in-order" movement has gained impetus. In the broad sense, however, concessions, as such, bring no permanent solution. Wage increases are swiftly nullified by adjustments in "real wages." Other improvements, such as vacations, seniority privileges, and so-called "morale moves," quickly become regarded by the employees as commonplace, and remain "concessions" only in the minds of employers. If anything, the labor movement tends to nullify the goodwill value of these betterments by intimating that there is "more where they came from," with the further intimation that management will "give" only when forced to do so by an up and coming union. The "gold cure" is, at best, a palliative in labor relations, and there is a practical limit to which it can be used. Giving ground will not necessarily operate to bring the really troublesome issues to a point of rest.

As experience with collective bargaining broadens, it becomes evident that it presents at least two distinct groups of problems. The "give and take" typical of negotiations respecting wages, hours and working conditions represents one type of problem. The other is typified in the issue of whether or not these exchanges are to be carried on in a spirit of hostility and suspicion. Businessmen who are willing to take their chances in the haggling over prices and conditions of work find themselves at a loss to cope with the proposition that people working under the same roof are to trade in antagonisms. The employer can deal in facts and figures affecting his business, but how does a fellow go about proving that he is not a "heel?" Thus industry faces the primary demands of labor on the one hand, and cross-currents of secondary discord on the other.

It appears probable that the primary issues of bargaining will be settled along compromise lines. Neither party to the controversy is engaged in a holy war. There are, of course, opposing convictions, but the term "bargaining" in the main aptly describes what goes on. Management leaves itself wide open when, faced with a demand for a 10c per hour increase, it insists that anything over 5¢ will ruin the business, and then proceeds to settle for 7¢ per hour. Labor, on its part, cannot afford to stage a continuous performance as Robin Hood, because it cannot win all of the time. The cold economics of wage and hour issues are necessarily brought increasingly into play as each side takes up slack in the exchange of "bid" and "ask." Agreements covering wages, hours and working conditions must ultimately make good sense or there will be fewer enterprises, and fewer jobs about which to bargain.

Secondary discords, however, represent a horse of different color. Organizing practices unleash a backwash of feelings of abuse and underdog attitudes. These are as fundamental to the boss and worker controversy as are wages and other tangible issues. Waiving all questions of justification or apology, one of the major problems in labor relations which must be faced realistically is this appeal to the sense of discord. If it can be successfully aroused and kept alive in our plants and offices, our problems are multiplied. In any case, industry should be sure that it adds no fuel to the fire on its own score.

Possibly the most basic element in labor relationships is nowhere better illustrated than in what happens when one worker, out of 10 in a line, is given the nod as a straw boss. In many individuals this prompts a profound change. Centuries of copybook maxims, and all the wisdom of the proverbs have done little to curb the human desire to strut, and to display tail feathers at the expense of one's fellows. Unfortunately, the lessons of human experience are not transmitted from one generation to the next. The human animal, placed in a position of authority, does not, by nature, tend to react very well.

Supervision, as a whole, agrees upon one great unpardonable sin. The worker who "goes over the head of the boss" has committed it. Whoever appeals to higher authority, particularly with regard to any matter arising within a personnel relationship, has "gone and done it." How much this jealousy of authority has contributed to industry's current predicament in labor relations is difficult to say. Obviously, however, the union organizer counts upon the confusion which he can throw into supervisory ranks, and knows that he can nearly always strike pay dirt when he can "bait the boss." There can be little doubt that much of the impetus of current union organizing is associated with the touchiness of supervisors, who so readily furnish

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material for "discrimination" charges when their authority appears questioned.

When top management has decided the limits to which it can go with wages, hours and working conditions, and agreement has been reached, that field of controversy is closed for the moment. Discords galore, however, can be ferreted out down the line. Striking evidence of this is furnished by the statement of an eastern corporation executive that over 60% of the petty strikes and interruptions of work in his company during 1938 were traceable to the failure of line supervision to carry out commitments already made by management. The supervisor, even when informed, tended to play solos and to interpret policy to suit himself. Union members and officers, more familiar with agreements, caught line supervision napping time and again. Management, to keep its word, had to reverse the supervisors, and the latter emerged rather groggy from the tilting.

Psychological Aspects

We do not make allowances which fit the psychology of this situation, because we have given so little thought to the basic nature of the supervisor-subordinate relationship. Latent in every human being, over and beyond his desire for existence and to preserve the race, is a craving for what might loosely be termed "social recognition." Authority, riches or anything else which offers realization of the yearned for feeling of self-importance in relation to other people, is something to hang on to if you have it, or to be sought even at the expense of the other fellow, if need be. We respect authority, and recognize the necessity for it in part, at least, because we hope, as individuals, to be situated at some time or other to exercise it. Even those who apparently retreat from the competition for advantage in this wicked world, expect somewhat better treatment in the next. Many an individual charged with a show of sour grapes, or who disavows all forms of self-seeking, is merely biding his time.

Along with this fundamental craving for recognition is a blindness with regard to our personal ability to handle it. Most people believe that if they could only get a certain job, there would be nothing else to worry about. In personnel work, the most frequent crowning argument in an appeal for promotion is that someone else, of whom the candidate obviously thinks no better than he does of himself, is making a go of the desired assignment. Probably there are fewer cases of suicide because so many of us can see ourselves as a success at almost anything. Considering the cravings and self-assurance which human beings have in common, it requires no great stretch of the imagination to visualize the reaction when someone else is assigned to a job which we want for ourselves. No one has to argue with us very much to prove that sinister, dark forces were at work in a conspiracy to contrive our defeat. If we can pin it on some person close at hand, we like that even better.

Now, of course, no one goes through the process of saying to himself: "I dislike my boss because he symbolizes frustration of my inborn desire for social recognition." The psychologists, themselves, only thought that one up a few years ago. The process is much more simple and direct. If the boss really seems to be a good sort, and puts in for promotions for us, we make allowances for him. We may even go so far, in face of some given disappointment, as to say that it really isn't the fault of the boss, but that it is due to the "system." On the other hand, if we are taken to task for mistakes, or instructed in a tone of voice not to our liking, these kind thoughts quickly dissolve. The boss needs a larger hat, you have to "lick his boots to get anywhere," and so on. These reactions are lightning quick, usually without reflection. We join forces with the next fellow, not because we think his case is really as meritorious as our own, but because we are brothers under a common tyranny. From this point, it is but a step to build a mountainous conviction that the boss is motivated solely by caprice and vagrant whims. We can believe that, even if he had a good idea, he wouldn't use it, because it is so much more to his liking to be arbitrary. Whatever happens is readily blamed on the fact that the boss his it "in for" us.

In contrast, the boss has no quarrel with the decision which placed him in a position of authority, and even less disposition to be critical of his own use of it. He is more likely to regard his promotion as proof that, occasionally, at least, true ability receives the recognition it deserves. Many times he starts off as a boss wholly without experience in making decisions. He is left merely to imitate some other boss whose "style" appealed to him. He may be cautioned not to let his head outgrow his hatband, but practically speaking, he is left to go it alone. In many instances, he feels that even to ask for advice is an admission of weakness.

Whether in recognition of this situation, or because no one has a better idea, the relationship between boss and worker has become a "No-Man's-Land," so far as rules of behavior are concerned. All degrees of tolerance and intolerance are practiced in various matters of discipline within this closed circle. In plain words, supervision has been taught to ride a high horse, and one of the traditional ways in which management shows confidence in a supervisor is not to question him about personnel relationships within his own bailiwick, or to permit anyone else to question his authority. Thus there is a good deal of practical truth in the worker's assumption that his immediate boss controls his destiny, all of which management approves as an evidence of "good organization." It has not been worth the trouble to find out what the worker has on his mind, because this gets the business out of "regular channels."

A National Explosion

Taking all of these factors into account, it is not strange that the pressures of the boss-worker relationship have fulminated an explosion on a national scale. Lacking avenues of appeal, the worker waits until he gains the strength to stage a revolt. In the process he may merely exchange a new form of tyranny for a very old one, but it is, if not of his own making, at least developed to cope with those with whom he feels in conflict. He demands that there should be rules to govern a relationship which he regards as arbitrary. He wants to write rules which, essentially, mean two bosses on the job.

Neither industry nor the worker himself can afford to allow this to happen. The need for effective management was never greater than it is today, and as between doing a better job in dealings with the worker, and throwing in the sponge, there is only one real choice. Management must find out what is wrong, and do everything possible to correct it.

This is not by any means to say, or to accept the position that our current labor relations problems are wholly due to misunderstandings between supervisors and their subordinates, or that we will solve our union problems merely by putting the finger on the boss. We do, however, want to make the point that while wages, hours and working conditions have received most of the attention, the militancy of the labor movement is grounded, in large part, upon grievances, many of them personal and petty, which arise from day to day on the job, and which have

nothing to do with hours of work or rates of pay. Present day collective bargaining experience includes numerous examples in which industry has shouldered enormous financial burdens, only to find that employee relations are worse than ever. Plants in which boss and workers have lived together for many years in reasonable tolerance, if not relative harmony, suddenly become infested with fist-shaking, name-calling and border-line insubordination. Organizing is no longer a question of putting specific wrongs to right, but one of looking for trouble, manufacturing rumors calculated to make the worker feel insecure, and making it a point of honor not to speak well of management, as a matter of principle.

Management Attitude

This sort of thing, which has been a long time coming out into the open, is not to be stemmed by a sudden change of front in which management assumes a belated concern over what goes on between boss and worker. Until recent years, any worker who complained higher up about his boss stood about a 3 to 1 chance of being sent packing back where he came from, with a "go-and-sin-no-more" admonition ringing in his ears. It is a bit late in the game for management to invite an outpouring of troubles. Moreover, some grievances are forwarded merely to create an effect. Labor has learned from rubbing elbows with politics that a loud cry to heaven regarding some frightful "bum beef" creates more excitement than does subsequent proof that the complaint was without basis. Likewise, to manufacture a worrisome rumor, and then lay it to rest, is a profound service to those who remain tractable only when worried.

These angles and possibilities, however, cannot be dismissed with the generality that labor's stock in trade is to cuss management. It is altogether too easy to blind ourselves to causes of just complaint, and to call the unionist a racketeer or a Communist. Even if we could prove that someone else is worse than we are, it would not solve this problem. Specifically, if one can trust the testimony of hundreds of grievances, there are a number of respects in which supervisors do not conduct themselves in employee dealings as they would if it were understood that each transaction was to be an open book. For one thing, supervisors create a backlog of resentment against the company by failure to deal directly with employees who fail to make good. They side-step their responsibilities in these cases by what is known in most companies as "passing the lemon." There is hardly a large organization in the country which does not have its "Devil's Island," composed of employees who have not fitted into any job, and who have been subjected to transfer after transfer, often without explanation. Supervisors regard this as a show of tolerance, and feel positively aggrieved when someone passed along in this fashion, and whose "progress" has been a succession of reserves, suddenly appears in the front rank of a union.

There is also a disposition to regard payroll classification system as an invasion of supervisory privacy. When management decides that pay for given services shall be in some stated amount, there are supervisors who have passed certain duties rather freely from hand to hand among their subordinates, who resent removal of this latitude. Hundreds of grievances have been prompted by rugged individualism along the line of working employees out of class, at less than agreed rates of pay.

These examples are cited, not in criticism of supervision, but to point out that difficulties of the type we encounter in collective bargaining would arise in almost any situation where we have not become accustomed to rules. Little has been done in the way of developing rules in these matters, because, traditionally, even to inquire into a supervisor's method of handling his employee relations is regarded as an unwarranted intrusion. Management, it now develops, has not known enough about what was going on, to decide the best practices. A second reason we have no rules is that, until recently, individuals on the receiving end of the supervisor-subordinate relationship have had no way of appealing complaints without risk of economic suicide. This is not to say that each and every boss and worker relationship had something wrong with it, or that there was any wholesale unfairness. A more proper statement of the case is that supervisors, as a group, have been left to develop and carry out their own ideas in employee dealings. As with any large scale production of ideas, all of them were not good, and many of them have been advanced to the point that the supervisor stands to lose face in reversing himself. As between "backing up" when it would appear that a subordinate had "put something over," and standing his ground, the supervisor usually has made a characteristically human choice. Supervisors are not the only ones who will not take correction if they do not approve of its source. There are instances on record in which top management has threatened to "go back to digging potatoes," or to shut up the plant, because employees wanted to present their grievances through a union.

The final outcome in dealing with these problems is, of course, utterly obscure. We have before us merely the evidence of what happens when there are no rules of the game. We cannot be sure that we can concoct good rules at the outset. We know that it took 100 years to teach people that accounting systems were not adopted fundamentally as a form of personal slander. There will likewise be a struggle to convince supervisors that primary personnel rules are not calculated to strip them of authority. Nonetheless, we cannot go on merely correcting violations of policy, and reversing actions taken by the supervisors. Unless we set up principles and procedures which alleviate or prevent avoidable grievances, the best of personnel practices will be nullified by discordant cross currents of complaint. Perhaps we can take our clue regarding what rules are needed from looking at the grievances themselves.

The Organizer's First Step

When the union organizer takes on a new company, the usual first step is to search out individuals who feel or can be made to feel that they have a personal grievance. The success of this search depends upon the degree to which the worker visualizes himself as an actual or potential victim of his boss. If it develops that the boss, in fact, has been a pretty decent fellow, the organizer makes the point that, after all, he may die tomorrow, or he may take a sudden notion to change his ways. If there has been a real disappointment in the worker's background, he is probably already "at outs" with his boss. However, the oddity is that those who most readily respond to organizing are the relatively new workers who do not know the firm, and who have a long road ahead of them. Whether this results from early discovery that there are more privates than generals in the organization, or from rubbing elbows with the particular older workers who have not advanced much beyond the starting job, the new employee predominates among those who warm up to the union appeal.

When personal grievances have been spotted, the organizer next takes on the management, usually hitting the weak side of the line. He asks for a meeting with top executives, and informs them that doubtless due to no intent on their part, certain infamies

are being practiced down the line. He offers to produce the more startling cases, if he can be assured that management will listen. He knows that management cannot be disinterested in actual grievances, and, with few exceptions, has an honest interest in correcting real abuses. Thus it is that the stream of grievance starts flowing. Some firms, of course, will have no truck with this sort of thing and seek to evade the organizer and his issues. As purely a matter of opinion, it appears likely that the time and energy devoted to dealing directly with the grievance problem will prove out more satisfactorily in the long run than even very clever evasion. However, it is our purpose here merely to deal objectively with the sort of thing which makes the worker feel at outs with his employer.

Most Common Grievances

By all odds, the most common employee grievance has to do with discipline in its various forms. Denial of a promotion, an actual demotion or just failure to be noticed offer sufficient basis for the employee to feel slighted. Unfortunately, it is no easy task to sit across the table from an individual and tell him that, due to errors or to inability, he is not going to be promoted, or that he must step down to the next lower job. Because no one likes to deliver bad news, the worker is more frequently "told off" than "told why."

Now it is only fair to state that were boss and worker to swap places, the man from the ranks would probably deal with these situations just as bluntly, and take no more pains to give a clear picture of his reasons. It is also true that the attempt to explain a disciplinary step frequently prompts unwelcome and apparently unprofitable argument. The emloyee's disposition to defend himself leads the supervisor to conclude that "some people wouldn't be satisfied with a gold brick served up on a gold platter," and the tendency may be to avoid this situation, where it can be done. As a result, probably well over 90% of the workers who file grievances following a demotion can say truthfully, "they never told me why."

One can argue that even in the absence of direct discussion the employee really knows what the trouble is. We can even be unrealistic enough to assume that he will see the justice of his punishment, and that there will be "no hard feelings." Yet the fact is that absence of warning or opportunity to improve, along with abruptness in delivering the bad news, puts the boss on the footing of "laying for" the employee, and to this extent, at least, of contriving his downfall. Instead of being an honored supervisory technique, the practice of letting an employee "hang himself by giving him rope," should be recognized as a prime cause of discord in employee relations.

It is, of course, true that many an employee gets "told off" from time to time, and that he may otherwise be given to understand that he is "in dutch," even to the point of nagging. The plain fact, however, is that supervision, as a whole, tends to handle employee discipline in such a way that critical outside professionals can make it appear inequitable, lacking in the rudiments of fair play, and simply a matter of "bad blood" between one man and another. It should not be difficult to develop procedures which meet these charges, and which eliminate any element of swooping down without warning.

First, the situation calls for moral courage, the exercise of which is just as much a part of the supervisor's job as is assignment of work. Delivering unfavorable news, even in the preliminary stages of correcting an employee, is an unpleasant task. However, it is not like an execution, of which it can be said "the sooner it is over, the better." The "word to the wise" approach, so often used as a means of making correction painless, frequently leaves no clear impression of what is wrong, and may not tell the employee what is expected of him. The grievance we get later on implies that the supervisor "wasn't man enough to tell the real reason."

Second, discipline should be preceeded by a clear-cut warning, related to tangible elements of job performance, in which the employee is required to improve in some stated respect, within a reasonable period of time. While there is no question that a "bad personal attitude" creates a problem on the job, there is some color of justice in the position that the employee is hired and paid primarily to perform certain services. If the employee is personally unpleasant, or otherwise unacceptable, it is a wise supervisor who deals with this sort of thing only to the extent that it actually affects the work. There should also be a clear distinction between the facts regarding performance, and the worker's motives. When it can be said that certain work was done, or that it was not done, we are dealing in facts. When we charge the employee with slighting the job "on purpose," we are getting into an entirely different field, which is not only speculative, but opens the door to all manner of excuses. Not the work, but the motive becomes the issue. This not only prompts innumerable alibis, but the warning process itself is pretty much a waste of time unless we presume upon good intentions. The supervisor appears at his best in the preliminary warning when he obviously wants to help the employee to succeed. He must, however, make it clear that he is not "fooling," and that the suggested improvement is requisite to remaining on the job.

Third, having laid a clear groundwork which enables the employee to make good if he can and if he really wants to, there should be good sportsmanship in taking account of results. The employee should be given credit for effort to improve, and the standard required of him should be no more exacting than the requirement placed upon any good, average employee. Having laid down conditions, there should be neither impossible obstacles, nor any element of "I-hope-you-break-your-neck," in the follow-through. Disciplinary cases in which these points have been observed do not lead to situations in which the supervisor has to be reversed, following a grievance. They also produce better work, because the level of supervisory accomplishment depends, in an important degree, on his effectiveness in dealing with his poorest workers.

A Grievance Meeting

A desk blotter view of what goes on in a grievance meeting, discloses the line of attack upon supervisory decisions commonly forwarded by unions. Skilled by long practice, the organizer is adept at making actions of the boss appear arbitrary and badly motivated. A demotion for cause becomes the crowning gesture of a long campaign of personal spite. A discharge is twisted where possible into a punishment for union activity, with the implication that specific offenses merely served as an excuse. The union is usually quite handy in developing and pressing discrimination charges before the Labor Board, as attested by thousands of restorations to the job, with back pay. The plain fact is that the advent of unions in many large firms has meant the virtual suspension of discipline, even where clearly proper and badly needed.

The union succeeds at this sort of thing, because it has a formula which almost always works. First, the employee under discipline is advised to "admit nothing," and the facts are challenged, on principle. When the basis for disciplinary action is stated,

the first countercharge from the union is that the worker was demoted or fired for "something he did not do," and there must have been some other reason, possibly connected with his wearing a union button on the job. All too often, supervisory observation is none too specific, and little of it is recorded. Moreover, the supervisor cannot absolutely deny a tinge of personal dislike, because the situation itself is unpleasant. Often the supervisor takes action based upon a single exasperating incident, but he assures those who handle grievances that the offense has happened "many times before." When actually pinned down as to where and when, he cannot distinctly recall. Asked if he has warned the employee, he indicates that he has given him a "talking to" many times, but that he might not actually have given a specific warning. In brief, the supervisor is caught off balance, and short on facts. The employee's buddies are prepared to stand by him, "right or wrong," and what started as a proper and reasonable disciplinary measure becomes a witch burning with the supervisor on the seat of honor.

The Answer: Records

The only answer to this sort of thing is records. Where there are instances of unacceptable performance, they should be set down in writing. That which has happened, or failed to happen, recorded as to time and place, with surrounding circumstances, if any, cannot later be challenged as an opinion or as a prejudice. The supervisor not only knows what he is talking about, but he can weigh the facts more accurately and surely because he has the record before him. This not only protects the supervisor, but insures the employees against needless injustice. For these reasons, it is to be regretted that many companies who do not cope successfully with grievances, nonetheless have not seriously undertaken development of employee records. In any case, supervisors who set down the facts in a potential disciplinary case neither commit injustices, nor are they tripped up later on.

The union, of course, does not wholly accept statements of fact. If given offenses are established as a matter of record, the second part of the grievance formula comes into play. This is to admit the facts, but to claim that they are not sufficient, or that they are not representative. Where possible, it is made to appear that someone who has done 15 years of good work is being railroaded "for doing 6 or 7 things wrong." At this stage, the effort is to make the facts look inconsequential.

As a practical matter, it is not difficult to deal with this part of the union formula. The facts usually speak for themselves, and it can readily be determined whether the information at hand is based upon isolated and unusual instances, or if there was a fair, random sampling of performance, in which a reasonable amount of work was reviewed so as to develop a representative picture. As a matter of experience, the union tends to cool off on this point, when you offer to extend the check to any reasonable length, provided they will agree to abide by the result. In any case, one must anticipate an effort to treat specific offenses as of really minor importance in comparison with the penalty.

Assuming that facts back us up on the point that offenses actually occurred, and that they were representative and important, the third comeback in the union formula is that, nonetheless, other people are getting away with the same things, and that the supervisor is just picking on one man. Does the union, as the saying goes, really "have us" there? Is the supervisor's justice even-handed, or does he play favorites? Again, there is only one way to tell, and again we must have records. Given errors are typical of given jobs, and the extent of errors is frequently the only difference between good and poor performance. Does the supervisor see the mistakes of people whom he does not like, and pass over the errors of employees toward whom he feels friendly? From experience in reviewing disciplinary cases, we would say that supervisors in general, particularly those who face their problems squarely rather than resorting to personal transfers, are not fairly charged with this kind of discrimination. We have experienced a few instances in which a worker, disciplined for a given failure, proves to have been "no worse" than several of his mates. This happens enough to be disconcerting, and suggests either an unwillingness to find out what is really going on, or a disposition to make allowances for one employee but not for another.

Elements of this three point union formula are distinctly challenging. No one can quarrel with the contention that an employee should not be punished for something which either "did not happen," or which is neither important nor representative of his work, or which other workers are "allowed to get away with." These propositions are so reasonable, and so elemental in their appeal to the sense of fairness that they have been assigned to the limbo of things which "go without saying." And that is precisely the trouble. People are nowhere more observant or inclined to over-play blind fortune than when left to follow some alleged instinct which is supposed to guide them unerringly around rough corners. Such "instincts" retain their respectability because man has made it the fashion not to question his neighbor's honor, his choice in women or horses, or his sense of fair play. Thus many a supervisor who has become reconciled to recording petty cash to the last penny, feels put out at the suggestion that he should keep account of his use of authority. The result is that some of them, when questioned regarding the background of a grievance, display the nonchalance commonly associated with being caught at a tender age in the jam closet.

Supervision Must Survive

The whole of this discussion is based on the premise that supervision must survive, if industry is to survive. The supervisor today is taking orders from a lot of places, and in many ways gets a beating which he doesn't deserve. However, his traditional self-sufficiency and secrecy in dealing with personnel relationships will have to go. Likewise, managements cannot afford to kiss off the problem between boss and worker by issuing edicts to the general effect that supervisors are expected to "always be fair." There must be a pointed effort to translate a desire to be fair into action which reaches the front line, and this constitutes a two-way job for both management and supervision.

Better standards of supervision in dealings with employees will not, as the saying goes, "beat out the unions." Neither will welfare plans installed just a few jumps ahead of the union organizer. The worker feels entitled to a real hearing in matters which affect his livelihood. The militancy of his union is sustained and intensified at every turn in which management, acting through supervision, makes the worker feel insecure. Management must demonstrate a willingness to go the second mile in dealing with issues involving the worker's job, but cannot afford to back-track when it is in the right. Nowadays, the fact that you are right is subject to proof.

Supervisors, in the main, need merely to reset their sights and their thinking. Basically, cross currents of discord in the ranks issue from the worker's desire for the rights of the strong. He also wants to keep the privileges

of the weak. His labor movement is based, in theory at least, upon the "brother's keeper" idea. Actually, in most cases, the worker wants to be kept, but he doesn't want a keeper. That is the basis of his attack on supervisory authority. Most of us are sold on indirect applications of the Golden Rule, and convinced that many problems would be solved if the other fellow "would do as *he* would be done by." This particular problem, however, happens to be in our own back yard. Our actions in dealing with the man in the ranks should be placed on a footing which we would not be ashamed to show to any impartial outsider. Facts slip by us, unless we record them.

To demonstrate, tangibly, that the worker gets a fair deal, a friendly warning and an opportunity to improve before his job is in actual jeopardy will do much to overcome current distrust of the man in the driver's seat. The fact that management controls only one-half of the strategy, and that it may not get a fair shake from the union, should not discourage us. We can, at least, clean up our own side of the show. In the process we may succeed in putting collective bargaining issues back on the track, and in removing them from the rubble of personal feelings, and from cross currents of manufactured disharmony.

The London Gas Center

ALL of the companies in London are in what is known as the London Gas Center for the war period. The government gave them areas to control. They pool their repair gangs and stocks of supplies, and have established a central office for information purposes.

The present system provides a gas engineer "adviser" for each region, and he is a working engineer. His duty is to advise the regional committee on gas supply regarding all supplies in the country, so that in case of emergency they can draw from the nearest region where what they need is available. Most of the other cities in England have only one gas company. Very few have municipally-owned plants.

When the gas storage tanks are blitzed, they run the gas straight from the producers into the pipes. On February 7, only 80 people in the whole London area were without gas.

They find that there are not as many valves on the gas mains as are needed.

A summary of the damage done to gas mains includes all the following size mains: 48 to 24 in.; 22 to 14 in.; 12 to 8 in.; 7 to 3 in.

It is not easy to knock out a gas works pumping station. It is most important to have available spare retorts; also there should be spare pumping plants which in England were established at the beginning of the war. The pumping plants should be as well protected as possible.

They have two types of gas tank: (1) the waterless, which is very dangerous and has been abandoned; and (2) the water-sealed tank, which is much better. They abandoned the waterless type for it is highly explosive.

Gas service has generally been maintained, although interruptions of from two to three weeks have been reported.

In dealing with the problem of gas supply under air raid conditions, the most important thing is communication. You must have not only one telephone exchange, but supplementary ones. The gas companies' facilities must be tied in in a manner similar to the working of the grid system on electricity.

Gas works have been hit, but with surprisingly little damage Gas tanks have been holed, but this has resulted only in a fire easily dealt with, and not an explosion.

In order to cut off gas if bombed, valves should be put on the trunk mains. After a break and the gas takes fire, the flames show up to an alarming degree. The usual system of cutting off the gas after a break is by the "bagging off" process. There are usually valves on all 48-in. mains or at the works.

Splendid results are being obtained with portable compressors, and have in many instances "bagged off" a main in 45 minutes from the time of the break. It is most important to have the self-contained type of compressor, and it must be mobile.

They have found that they can seldom use a "stopper" on account of the sewage which gets into the mains. Also with the gas and water mains side by side in the streets, and the higher water pressure, water gets into the gas mains and when the gas is used water comes into the household appliance.

They are using the fire brigades to suck the water out of the gas mains, but must be very careful not to have the gas stoves, etc., open.

The people living in the territory served by a broken gas main are notified by a loud speaker and by ARP wardens.

The water supply must be shut off when pumping out the gas mains.

They are now mapping the low spots in the gas mains and so will soon know where to pump without any delay.

To date there has not been a single fire started due to broken gas mains.

To isolate an area, they "valve" it in such a way as to shut off the gas.

They have trained gangs which, with the use of the map, go out and shut off the gas according to "plan." These gangs are held at depots that are established all over London, and are equipped to move fast at an instant's notice.

Observers: One of the greatest helps they have had is through a staff of "observers." These men have second-hand motor cars, three men to a car. Their prime duty is to report just what has happened. These men are equipped to turn off the gas to a house and know exactly where to look for the valve. This saves sending a big gang, which probably will be needed badly at some other point. With the three-man observer gang, two of the men can stop and do a job while the third man and the car can return and get another gang and do another job.

Reporting Service: It is most important to set up a reporting service and to have a secret telephone number which only the ARP wardens, the police, and the fire brigade know, they being the only ones who can communicate in an emergency. This system is vitally necessary, as otherwise all your telephones would be jammed with people calling in about their troubles.

In London they have established a gas control center system, which is under the management of experienced executives, one of these executives is on duty constantly. These men can tell the control centers what to do. They have two central stations, in case one is put out of business. There must be a duplicate set-up with maps, etc., showing valves and other things of importance, and it must always be kept up to date.

They have telegraph and two telephones, one private line in each central station.

To supplement telephone service, motorcycles and bicycles are used, and the couriers have been well trained, know the city intimately, and are on duty night and day.

Air-Defense Fittings for Broken Gas Mains

THE unusual severity of the damage resulting from bombs* falling on or near cast-iron gas mains, and the special urgency of quick restoration of service makes this repair problem much more difficult than that of ordinary repairs during normal times. The frequency and extent of damage during an air raid will generally be such as to render customary peace-time repair methods wholly impracticable.

The irregular fractures of the shattered pipe ends to be rejoined present a major obstacle to the use of ordinary couplings or sleeves, which will probably not be sufficiently long to reach the sound pipe beyond the fracture. If it were necessary to cut off shattered ends and square up the pipe to receive a regular coupling or sleeve, much undesirable extra equipment, work and delay would be involved.

Another problem of major importance in the design of air-defense fittings is the variability in the diameter of cast-iron pipe in each nominal size. Under ordinary circumstances it may be feasible to carry several sizes of repair sleeves or fittings for a given size of pipe, but for the purposes of air defense, a reduction of the stock to an absolute minimum number of items is essential in order to simplify transportation and handling, as well as to avoid any misfits on the job.

Naturally, the ideal fittings must be simple and quick to install, require a minimum of equipment, should be light and easy to handle, must be safe and positive in performance, and reasonable in cost. Permanence is also a highly desirable characteristic, as it may not be feasible to replace temporary repairs and much time and trouble can be saved with a quick, permanent repair in the first instance.

Since the English were confronted with the problem of bombed main repairs long before it was considered of importance to us, we find that they have devised practicable methods which will serve as a foundation for our own developments. The English practice involves two rather distinct types of fittings, with several variations to meet special circumstances. These are as follows:

1. *Mechanical Joint Fitting* consisting essentially of a long sleeve mechanical joint to fit over the cast-iron main and having a flange at the opposite end to connect to light-weight flanged steel pipe.

2. *Tubular Gasket Fitting* consisting of a piece of light-weight steel pipe smaller than the inside diameter of the main, and having a tubular gasket affixed at one end.

A number of ideas have been proposed as alternates or improvements on the English methods listed above. A brief description of these follows:

1. A regular long sleeve to fit the maximum O.D. of the nominal size to be repaired. Steel pipe of maximum O.D. size is used with couplings for intermediate joints. The gasket on the cast-iron pipe is provided with laminations for adjustment to fit smaller sizes.

2. A method intended to utilize standard coupling parts and steel pipe of a size to slip over the cast-iron main, thus avoiding any limitations of length.

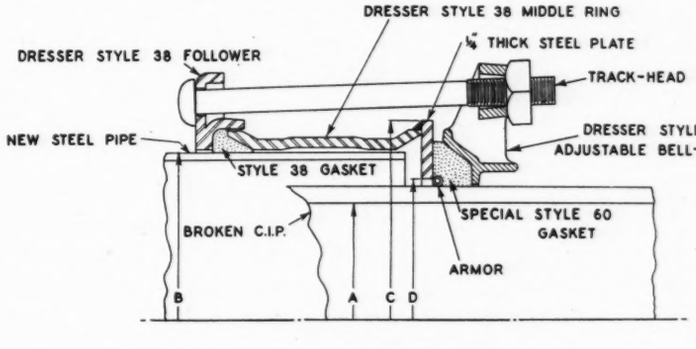
3. A proposal to utilize a special adaptation of the new Dresser Style 85 Mechanical Joint. Two gaskets or an extra-long gasket are used to provide take-up for pipe variation. The spigot end of the bell adapter is made to a standard steep pipe O.D., such that adapter and steel pipe can slip over the cast-iron pipe.

4. An elaboration of the English scheme utilizing a tubular gasket. In this case the gasket is housed in a bell adapter which will slip over the largest cast-iron main of a given nominal size. The spigot end of the fitting is made to a standard steel pipe O. D. and regular couplings are used for intermediate joints. The bell is provided with a recess which is caulked with quick-setting cement, after the tubular gasket has been inflated to make a temporary seal. This seal would be relied upon only long enough for the cement to set, after which a regular Dresser Style 60 Adjustable Bell-Joint Clamp is applied as a permanent seal. The clamp is bolted to lugs on the outside of the bell, dispensing with a bell ring.

5. The tubular gasket and caulking of the previous proposal are eliminated. To prevent flow of the gasket into the space between bell and pipe the clamp has a special armored gasket. The armor is located at the inside corner of the gasket and is larger than the clearance between the inside of the bell and the smallest pipe of the given nominal size. Therefore, it is unnecessary to do any caulking or other filling of the space between the adapter and the main.

All of these proposals or designs involve some more or less objectionable features. However, by redesigning and simplifying the adapter of the latter proposal, fittings have been developed which appear to meet all the requirements of adjustability, speed, simplicity, permanence, and low cost.

No. 1 (see Fig. 1) is suitable for sizes from 3 to 14-in. CIP, inclusive. In this design the adapter is made from a regular coupling middle ring, to which a steel plate is welded to act as a bearing surface for the clamp gas-

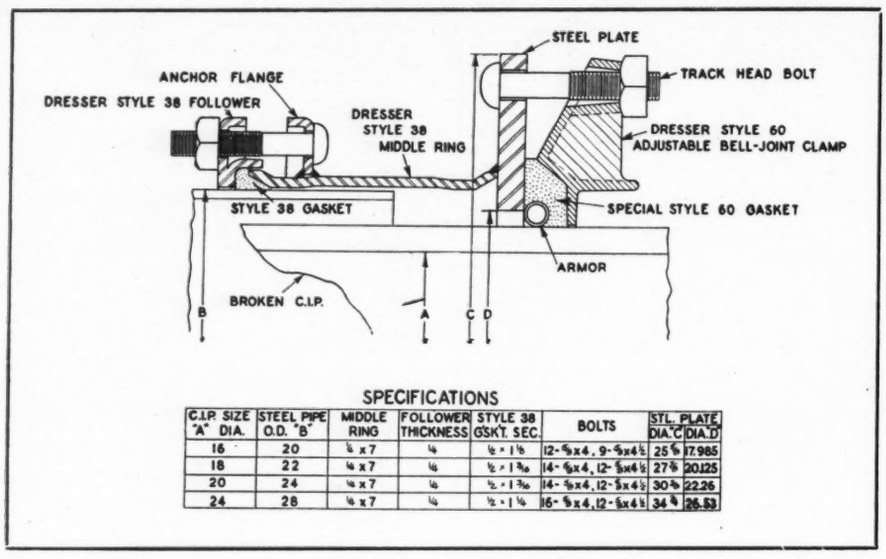


SPECIFICATIONS

C.I.P. SIZE "A" DIA.	STEEL PIPE O.D. "B"	MIDDLE RING	FOLLOWER THICKNESS	STYLE 38 GSK'T. SEC.	BOLTS	STL. PLATE DIA."C"	STL. PLATE DIA."D"
3	5 9/16	⅛ x 5	⅛	½ x 1	4-⅝ x 9	6⅝	4.085
4	6 5/8	⅛ x 5	⅛	½ x 1	4-⅝ x 9	7⅝	5.185
6	8 5/8	⅛ x 5	⅛	½ x 1	6-⅝ x 9½	9⅝	7.285
8	10 ¾	⅛ x 5	⅛	½ x 1	6-⅝ x 9½	12	9.485
10	12 ¾	⅛ x 5	⅛	½ x 1	8-⅝ x 9½	14	11.585
12	16	⅛ x 7	⅛	½ x 1⅛	8-⅝ x 12	17¼	13.685
14	18	⅛ x 7	⅛	½ x 1⅛	9-⅝ x 12	19¼	15.835

FIG. 1. Dresser Manufacturing Co.'s air defense fitting No. 1 for C. I. P. sizes 3 to 14-in. inclusive.

*Excerpt from a report, "The Development of Air-Defense Fittings for Repairing Broken Cast-Iron Mains," published by the Dresser Manufacturing Co., Bradford, Pa.



SPECIFICATIONS

C.I.P. SIZE "A" DIA.	STEEL PIPE O.D. "B"	MIDDLE RING	FOLLOWER THICKNESS	STYLE 38 GSKT. SEC.	BOLTS	STL. PLATE DIA. "C"	STL. PLATE DIA. "D"
16	20	⅜ x 7	¼	½ × 1⅛	12-⅝x4, 9-⅝x4½	25⅝	17.985
18	22	⅜ x 7	¼	½ × 1⅜	14-⅝x4, 12-⅝x4½	27⅝	20.125
20	24	⅜ x 7	¼	½ × 1⅜	14-⅝x4, 12-⅝x4½	30⅝	22.26
24	28	⅜ x 7	¼	½ × 1¼	16-⅝x4, 12-⅝x4½	34⅝	26.53

FIG. 2. Dresser Manufacturing Co.'s air defense fitting No. 2 for sizes 16-in. C. I. P. and larger.

ket. Steel pipe of standard O.D.'s, as given in the specification table, are used for the replacement sections, intermediate joints being made with regular Dresser couplings. A regular coupling gasket and follower make the seal between steel pipe and adapter. Through bolts from clamp spigot ring to coupling follower compress both gaskets simultaneously. In some sizes it will be necessary to cut special holes in the coupling follower to match the number of holes in the clamp, as these do not coincide in every instance. The holes can be burned out with a torch, or if the followers are ordered as parts, they can be specially punched at the factory.

No. 2, (see Fig. 2) for sizes 16-in CIP and larger is similar to No. 1, except that through bolts are not used. the difference in bolt circle diameters between coupling follower and clamp spigot becoming so great that the bolt angularity would be excessive. Therefore, the adapter plate is made large enough to serve as an anchor for the clamp, an anchor flange is welded to the middle ring, and short bolts are used at each end. The anchor flange is easily made by torch-cutting a regular coupling follower. No. 1 Fittings could be made in larger sizes by using larger steel pipe, but it is, of course, desirable to keep the size of replacement pipe to a minimum.

The fittings are readily made from standard parts either by the manufacturer or in the gas company's own shop. The only part not ordinarily carried in stock by most gas companies is the special armored gasket. The latter, of course, should be stocked in sufficient quantities to meet any emergency. Since a good stock of couplings, clamps, bolts, and steel plate would always be on hand, there is little danger of being caught short by an unusually severe raid. Additional fittings can be made up quickly from the standard material.

High Pressure Dehydration

As Applied to Repressuring and Pressure Maintenance

By R. A. CARTER

Superintendent, Natural Gasoline and Gas Division
Continental Oil Company,
Ponca City, Oklahoma

MANY articles on natural gas hydrates have been published during the past several years, and these are to be found in complete progression in the various trade journals. Some of these articles have discussed in detail the chemical and physical composition of gas hydrates, while others have dealt with practical field operating difficulties and have disclosed ways and means of overcoming such difficulties. Most articles of the latter kind have been confined largely to problems of transporting gas through commercial pipe lines over considerable distances rather than relatively short distances encountered in most field pressure maintenance operations.

Fig. 1 is a pipe partially plugged with hydrates. The hydrates begin to form on the inner wall of the pipe, gradually getting heavier until only a small orifice remains. From this point on the formation is accelerated because of expansion of the gas, and the line soon becomes completely plugged.

It is this condition with which the field man is confronted, and he must in this day and age arrive at a solution for a minimum of expenditure; and many and ingenious are the methods and devices used to accomplish the results desired. The following are a few methods:

1. *Reduction in line pressure:* Reduction in line pressure consists of cooling and trapping out the water at an elevated pressure, then decreasing the pressure through a regulator or control valve, resulting in a partially dehumidified gas flow. The application of this principle is very limited and is of advantage only over a very narrow temperature range.

2. *Heating the gas line:* Heating the gas flow is perhaps the most frequently used method of preventing hydrate formation in field operation. The methods used for heating gas flow are quite varied and sometimes ingenious. One

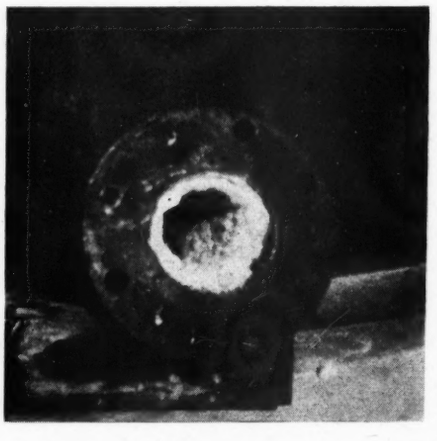


FIG. 1. A pipe partially plugged with hydrates.

method quite frequently used in pressure maintenance operation is to transport gas direct from the compressor discharge, without cooling, to an input well, thus using the heat of compression. For large gas flows this method has been used quite successfully. If a line is quite long it can be insulated with an inexpensive material, such as sawdust or cottonseed hulls, to retard the dissipation of heat.

Fig. 2 shows an indirect heater used in the field to heat gas at the input well meter setting. Such equipment is relatively inexpensive and has proved satisfactory for small flows in localized areas.

This is a small heater made from a piece of 10 or 12 in. casing approximately 2 ft. long. A coil of copper tubing is wound around the flue which extends from the combustion chamber in the bottom of the heater up through the water. The number of feet in this coil and the size of the tube is varied to meet the rates of flow. The fuel for the burner is taken off this copper tubing to prevent its freezing. The temperature of the water in the heater is maintained below boiling so as to prevent excessive evaporation.

For larger flows a more elaborate heater is used, such as the one pictured by Fig. 3.

This is a heater made up of a shell and tube bundle in the upper section, and the bottom part contains a gas burner. This particular heater is also open to the atmosphere and is maintained at a temperature below the boiling point of water. Some of the installations have been enclosed and operated at a pressure of about 15 lbs., and the fuel is regulated by a valve operating on the pressure within the water compartment of the heater. The evaporation in this latter type of heater is practically negligible and has operated satisfactorily with a very minimum of attention.

3. *Lubricating materials into line:* Methods of lubricating material into flow lines are in common use, and materials used have ranged from crude oil to anhydrous ammonia. In fact, crude oil will sometimes give sufficient lubrication to the hydrate particles so that the line will operate satisfactorily.

Alcohol is perhaps most frequently used, and a typical lubricator is shown in Fig. 4.

This lubricator is installed in a bypass on the line so that the pressure on the lubricator is equalized with that in line, and the alcohol drips through the sight feed lubricator into the line by gravity. It is also shop-made, and its size depends upon the quantity of material needed per day so as to require not too frequent fillings.

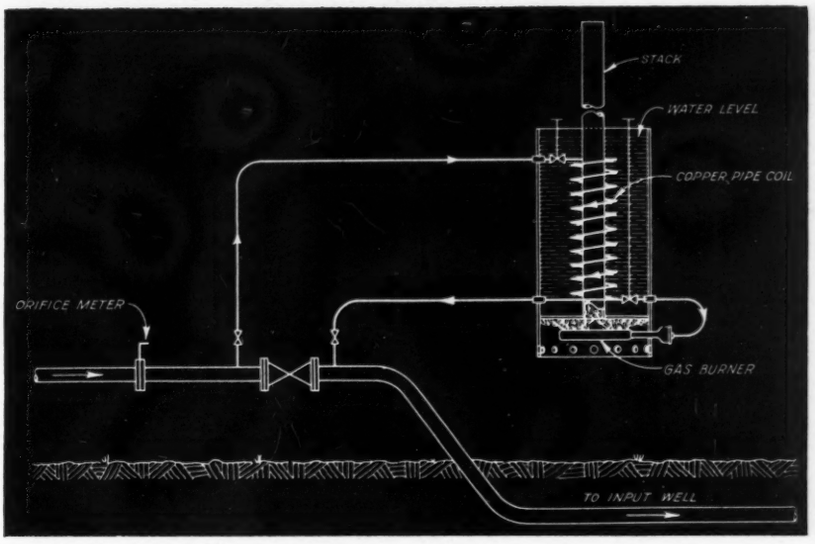


FIG. 2.
(Above)
An indirect gas-fired heater for small gas volume.

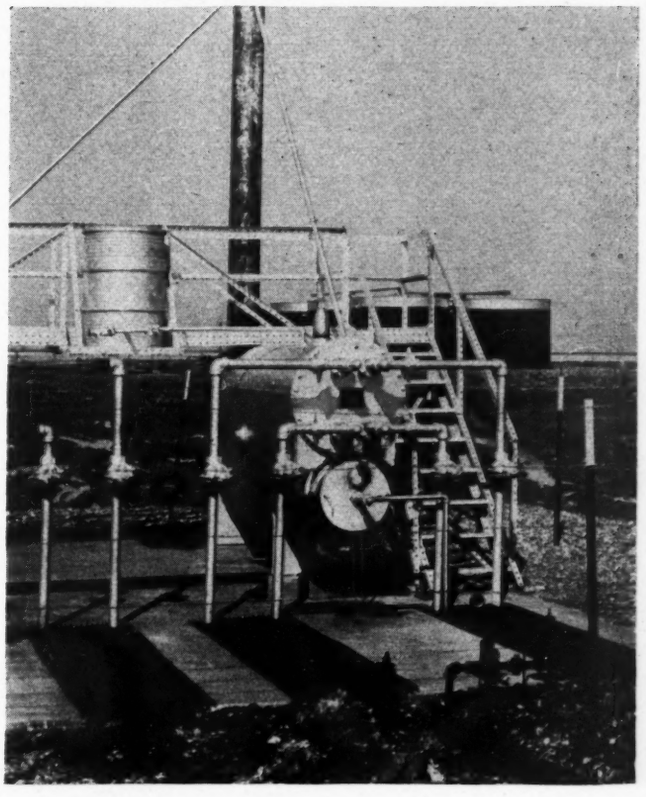
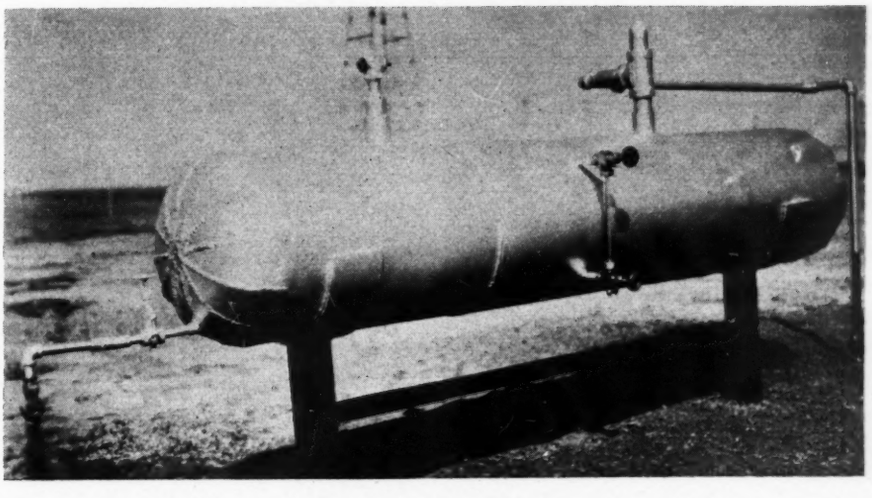


FIG. 3.
(At right)
More elaborate heater used for the field heating of gas.

FIG. 4.
(Below)
Typical lubricator.



R. A. CARTER

R. A. CARTER, after having his studies for a medical career interrupted by World War No. 1, obtained his first experience in the natural gas business with Lone Star Gas Co., Petrolia, Texas, in 1917. From that time until 1923 when he entered the services of Texhoma Oil & Refining Co., he worked in various capacities for the Lone Star Gas Co., Skelly Oil Co., Western By-Products Co., and Lindsey Engineering Co. It was through the purchase in 1926 of Texhoma Oil & Refining Co. that he became associated with Continental Oil Co. He operated gasoline plants in Texas, Colorado, Wyoming, and Montana until 1936, when he came to Ponca City, Okla., as superintendent of the natural gasoline and gas division of Continental Oil Co., the position he now holds.

The paper herewith printed was presented before the annual meeting of the Natural Gasoline Association of America, Baker Hotel, Dallas, Texas, April 23-25.—(Abstract by GAS.)

Alcohol is apparently limited in its field of usefulness to lines operating under relatively low pressures. While no concrete data were obtained to substantiate such claims, it is thought probable that alcohol will itself form a hydrate at higher pressures. At pressures between 1800 and 2000 lbs., alcohol when lubricated into a pressure maintenance line actually caused the line to become plugged more quickly than when none was used.

Ammonia has been used with varying degrees of success; however, most natural gas contains appreciable quantities of carbon dioxide which readily combine with the ammonia to form ammonium carbonates in sufficient quantities to cause not only line plugging similar to hydrates but to use up such quantities of ammonia that its use is quite costly.

Calcium chloride brine has been used in some cases quite successfully; but it is not the most desirable because it is quite corrosive to field lines, and deposits carried over tend to plug pore space in injection wells.

Perhaps the most satisfactory use of calcium chloride has been to prevent freezing in vacuum lines in the Rocky Mountain area. Fig. 5 shows a typical chloride pot in which lump chloride is used. The gas merely passes over and around the lump chloride, and the brine formed is permitted to flow to a collection drip where it is picked up and evaporated and reused. This is a very economical method both as to first cost and continued operation.

4. *Partial dehydration or dehumidification:* Partial dehumidification is certainly the most reliable and trouble-free method of solving the hydrate problem; and two methods have been successfully employed. A method using a solid material such as activated alumina has given good results. The equipment used in this method is shown in Fig. 6.

Two towers are used in this method, so manifolded that one is used to dehydrate the gas while the other is being regenerated. The residue from the absorber passes into the top of the tower, down through the bed of activated alumina, and out the bottom to the field lines. While No. 1 tower is being so used gas is heated in a direct-fired Dutch oven and passed into the bottom of the other tower. This circuit is illustrated by the dotted lines. The temperature of the gas out of the Dutch oven is maintained at about 400° F. and is permitted to pass through the tower until the outlet temperature of the gas reaches about 2[illegible]. The hot gas is then cut out, the tower permitted to cool to a temperature of around 100° or lower if atmospheric conditions will permit, and it is ready for use again when the water content of the last tower is too high to prevent further absorption by the alumina.

There are several liquids used in continuous dehyration systems but the diethylene glycol equipment shown in Fig. 7 has proved one of the most successful.

This figure illustrates the cycle of a combination compression and refrigeration plant. Gas is taken in from the field and passed through two stages of compression and cooling, and the water

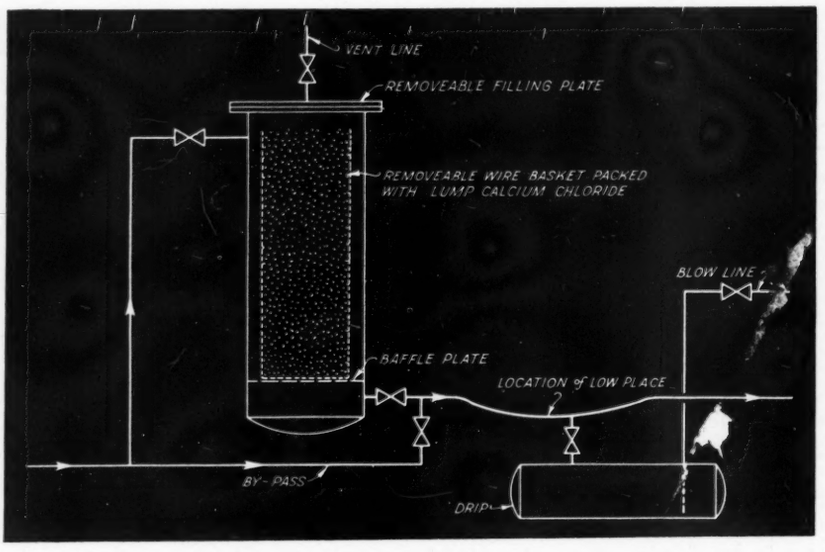


FIG. 5. Typical installation of calcium chloride dehumidifier.

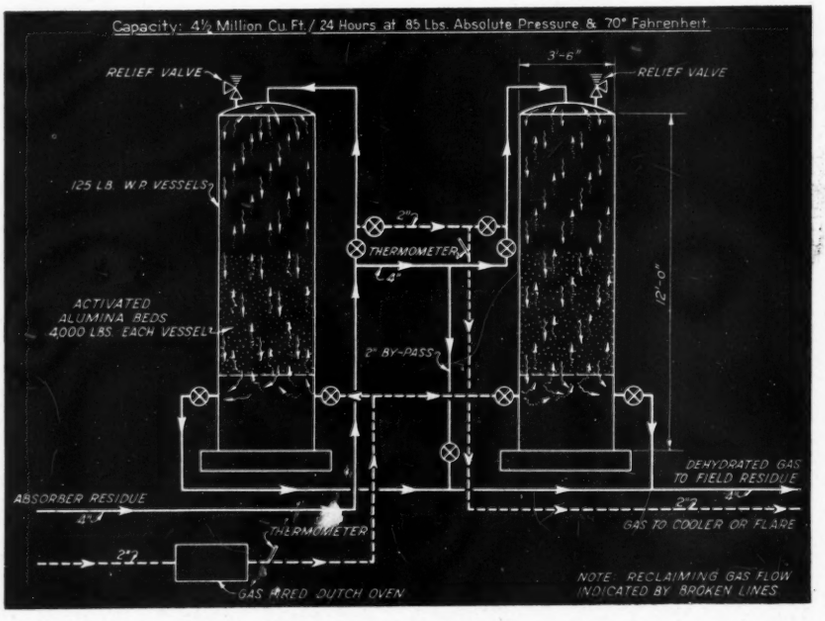


FIG. 6. Activated alumina dehydration system.

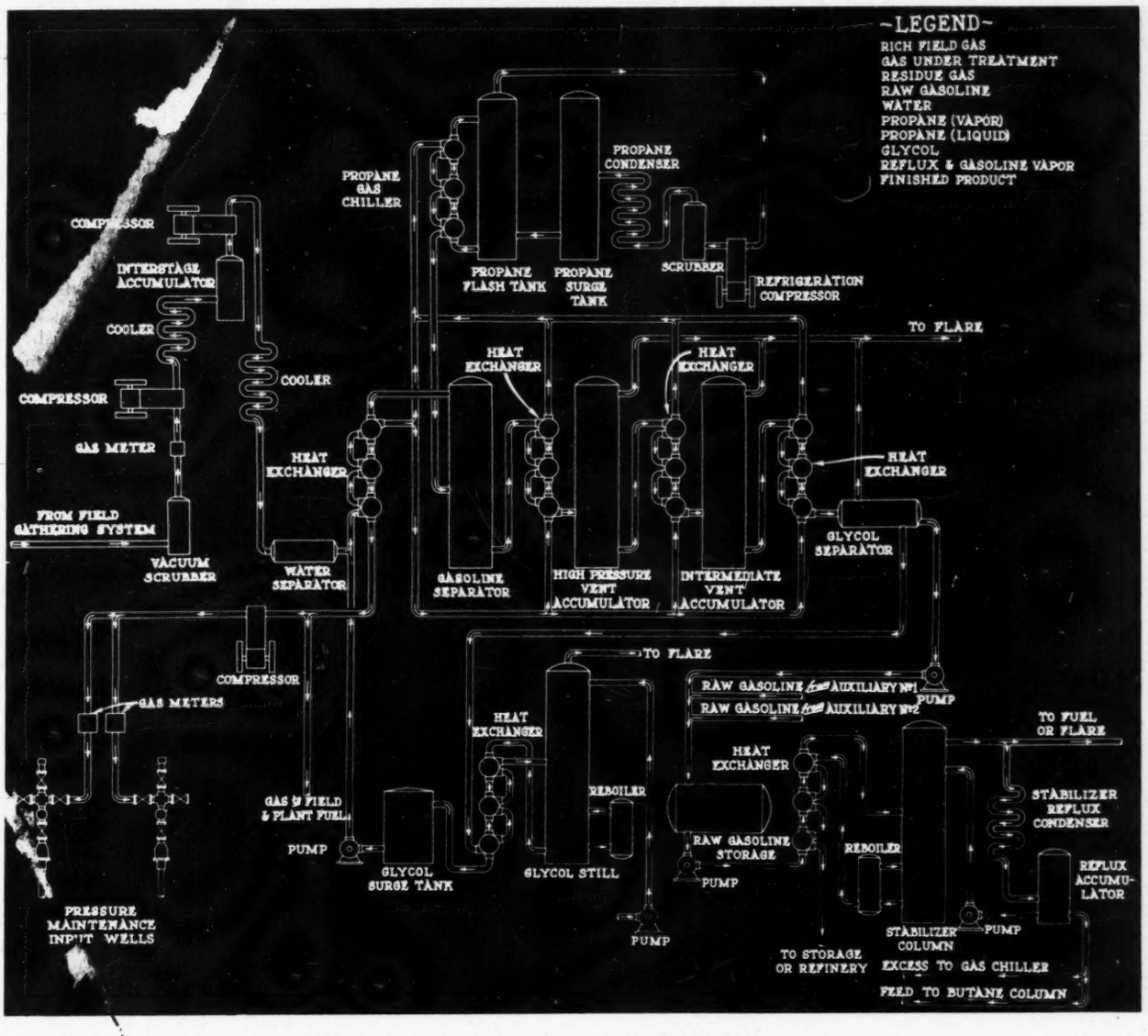


FIG. 7. Cycle of a combination compression and refrigeration plant.

is trapped from the hydrocarbons in the water separator. The gasoline and the gas pass out of the water separator, meet the stream of glycol being pumped from the glycol surge tank. and the mixture flows in through the exchangers and chillers into the gasoline separator. The uncondensed gases leave the top of the gasoline separator, pass back countercurrent through the heat exchangers, and thence to the high-stage compressor for input well injection. The gasoline and glycol in the bottom of the gasoline separator are passed through some additional heat exchangers into a high-pressure vent accumulator where some of the high fractions are permitted to escape. From the high-pressure vent accumulator the glycol and gasoline pass through additional heat exchangers into an intermediate vent accumulator. The cycle is the same as in the previous vent accumulator until the gasoline and glycol reach the tank called the glycol separator. At this point the glycol and gasoline are separated by gravity, gasoline going to the raw gasoline storage tank and the glycol to the glycol still where it is concentrated to a strength of about 75% in this particular operation. After concentration it flows to the glycol surge tank, and then the cycle is begun again. We have found that a concentration of about 75% and a contact temperature of about 10° below zero gas is sufficient dehumidification to serve the purpose in this instance. It should be noted here that while the higher the concentration the lower the dew point depression becomes, it is also true that the liquid becomes more viscuous, causing it to adhere to the tubes of the exchangers and chillers and create an insulating effect so that trouble is encountered. Therefore, there is a very definite point at which the concentration and the contact temperatures must be maintained for trouble-free operation.

The operating cost of either the activated alumina or liquid system is extremely small when installed in a repressuring or pressure maintenance plant. Generally no additional operating labor is required, and the make-up chemicals are almost negligible. The initial investment cost on either of these system is, however, a substantial amount; but since each such installation is a separate problem, it is not practical to assert that one method is less costly than the other. For relatively small rates of flow, however, it has generally been found that the solid material, such as activated alumina for dehydration, is lower on investment cost; while for larger flows the liquid dehydrating systems have the advantage for initial installation expenditure.

OPERATING IDEAS

Pipe Straightening Device

SIMPLE in operation, but representing great savings in time and expense over other methods of straightening pipe, a device designed by H. A. Lane, truck driver for the United Gas Pipe Line Co., Shreveport, La., has proved efficient and satisfactory after more than 1900 tests.

A home-made jack having a capacity of 20 tons, welded to a handle made from ½ in. line pipe and connected to a pump of standard make was built by Mr. Lane, assisted by C. C. Cage, machinist, to perform the pipe straightening operation. It can be easily set in place inside the pipe by means of the long handle and in operation straightens the worst dents in one to three minutes. Total cost of all material and time expended in building the tool was approximately $80.00.

Sags and dents in pipe were previously removed by cutting out the section of pipe in which they occur and welding the pipe together again. Necessitating two cuts and a welding job, it can easily be seen that this method is many times more expensive than use of the new device.

H. A. Lane, employe of the United Gas Pipe Line Co., demonstrating the use of the pipe-straightener which he designed.

Wrinkle Bending of Non-Ferrous Pipe

THE wrinkle-bending of steel pipe* has become a routine operation during the past few years, not only for the bending of overland pipe lines, but for many industrial and domestic applications as well. In fact, the process has proved such a simple and economical way for obtaining bends in steel pipe, that there has been a long-felt desire for a similar method for bending non-ferrous pipe and tubing. Recent investigations have now led to the development of such a method, applicable to copper, brass, aluminum and stainless steel.

*Abstracted from an article, "Wrinkle-Bending Non-Ferrous Pipe and Tubing," from *Oxy-Acetylene Tips*, May, 1941, published by The Linde Air Products Co., New York City.

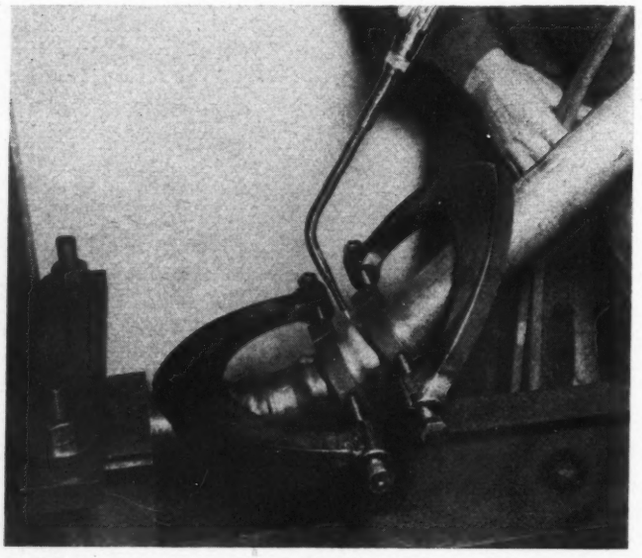


FIG. 1.

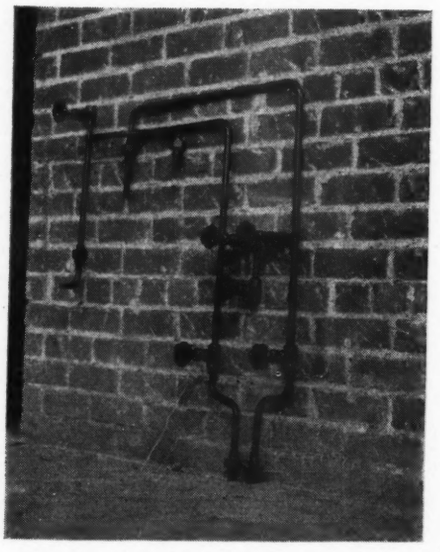
Bending rig for the wrinkle-bending of non-ferrous pipe.

Briefly, the bending procedure consists of clamping one end of the pipe, laying off the wrinkle spacing and attaching the clamp jaws on either side of the wrinkle. The pipe is then heated, and, as the metal softens, the free end of the pipe is raised by means of the jack and chain arrangement.

The bending rig, (See Fig. 1) has proved highly successful for making bends in non-ferrous pipe. However, the actual design of the rig can be varied to suit the particular needs of the piping job in question. Stripped to its essentials, the rig is merely a means for securely clamping one end of the pipe while a gradual pull upward is applied to the opposite end. There are many variations which can be worked out and which will provide these basic principles.

■ ■

Welded Pipe for Orifice Meters



A typical installation, showing bent and welded tubing.

THE Lone Star Gas Co., Dallas, Texas, has now standardized on welded piping for orifice meter installations. As seen in the illustration, the piping is made of seamless tubing. All "els" are made in a pipe bending machine. "T's" are made by welding the tubing. The bonnets are removed from the steel needle valves and the threaded connections are then bronze welded. The only threaded connections are those into the meter and these can readily be tightened by loosening the adjacent unions. This piping standardization has practically eliminated trouble due to meter freezing and is a great time saver for the meter inspector.

A Dual Cathodic Protection Set-Up

By HARRIS WHITE

El Paso Natural Gas Co.,
El Paso, Texas

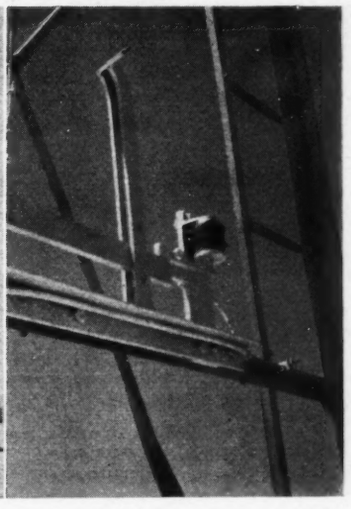


FIG. 1 (left). Cathodic Protection Station No. 30 located in the salt flats. Note the piles necessary for supporting the house. FIG. 2 (right). The magnetic brake release.

IN May of 1937, a 20-volt, 80-ampere, wind-driven generator was put in service at Salt Flats in order to reduce the electrolytic corrosion occurring on the pipe line at that point. At that time the line was on wooden piers about 5 ft. above the ground across most of the flat. When the line was looped through this section during the summer of 1940, both lines were buried across the entire flats. It then became necessary to redesign the protection station in order to protect both lines at all times. A fairly elaborate scheme was hit upon.

In order to secure protection at all times, a 20-40-volt, 100-ampere generator was installed. This generator is driven by a 5 hp. gas engine. The pipe line was tapped to supply fuel for the engine. It was mounted on a platform 5 ft. above the ground for protection from high water. The engine is a water-cooled job designated for continuous operation and is especially fitted for pipe line cathodic plants. The generator is of sufficiently high rating to provide adequate protection for the increased surface due to the loop line if kept in constant operation. The ground bed for Cathodic Protection Station No. 13 is a horizontal scrap iron bed; that for Cathodic Protection Station No. 30 is a vertical bed composed of 19 carbon rods.

By using the two stations in conjunction with each other, it is believed that adequate protection can be provided the pipe line in the vicinity of the Salt Flats.

It is impossible to run both the wind-generator (C.P.S. No. 13) and the gas-engine generator (C.P.S. No. 30) at the same time. The reason for this is that when the wind is not blowing some of the current from C.P.S. No. 30 would "back-flow" through C.P.S. No. 13 and cause the latter's field to depolarize; it is even possible for the field of the wind-generator to magnetize in the reverse direction. When the wind finally started up, the current from C.P.S. No. 13 would be destructive instead of protective.

However, the redesign called for the maintenance of the C.P.S. No. 13 as a standby. In the final arrangement, the brake of C.P.S. No. 13 is held in place by an electro-magnet energized by C.P.S. No. 30. A single wire line was run between the two stations (approximately 2000 ft. apart) to supply the current for the magnet from C.P.S. No. 30. If the engine dies the electro-magnet releases the brake on the wind-generator and at the same time closes a switch that connects C.P.S. No. 13 to the pipe line. In this way temporary protection will be supplied when the wind is blowing and C.P.S. No. 30 is down.

It is desired, though, to keep C.P.S. No. 30 running most of the time. In order to tell when it is running, a repeat-coil was placed in the company's telephone line at the Flats. The generator voltage of the C.P.S. No. 30 was tied between the center tap of the repeat coil and the pipe line. A volunteer was placed on the instrument panel at the El Paso City Gate and connected between the center tap of the repeat coil at the El Paso end of the telephone line and the pipe line. This connection does not interfere in any manner with telephone conversations taking place over the line. In this way it is possible to tell in El Paso whether or not the gas-engine at the Salt Flats is running.

Oklahoma Towns Get New Gas Supply

THE towns of Skiatook and Sperry, Okla., have made arrangements to secure a supply of natural gas from transmission lines of the Oklahoma Natural Gas Co., Tulsa. The new supply is scheduled to be available by December 15.

Both towns were threatened with entire suspension of their gas service, which for years has been supplied from lines of the Union Gas System, Inc., Independence, Kan. The latter concern last spring filed an application before the Oklahoma Corporation Commission to discontinue its supply to the Natural Gas Service Co., which distributes the gas to the two cities. The application also asked permission to take up its lines on the claim that a local supply was no longer available.

Through the arrangement finally made with Oklahoma Natural, a 6-in. gas line 10 miles long will be laid by that company from Turley to Sperry, where it will connect with a 6-in. line to be constructed by the Union Gas System to extend from Sperry to Skiatook. When this arrangement is completed the Union Gas System will be authorized to take up its gathering lines and such transmission lines as are not being used.

The Oklahoma Natural Co. and the Union Gas System are to be reimbursed for construction of their supply lines through a five cents per M c. f. rental charge in addition to increased rates to be paid to the Natural Gas Service Co., local distributor.

■ ■

Montana Gas Production Up

Montana natural gas wells produced 1,884,378,000 cu. ft. during the month of September, 1941. This figure is an increase of 304,607,000 cu. ft. over natural gas production during the month of August, 1941.

SALES Slants

Laclede's Clinic for Ailing Sales

A NOVEL program for emphasis on home heating sales during the next few months in St. Louis, Mo., was held by the Laclede Gas Light Co. of that city recently at the De Soto Hotel when 30 domestic heating salesmen of the company acted as "consulting physicians" in diagnosing the condition of "sick sales" and listened to prescriptions for overcoming the difficulties involved.

The two-day clinic was directed by R. J. Vandagriff, general sales manager of the company, D. J. Fagin, manager of the sales engineering division, and three sales experts from the Surface Combustion Corp., R. Towne, Harry Gurney, and Robert Kemper. One of the first such sales programs ever laid out, the meeting was attended by all homeheating department employees.

The subject was particularly timely in St. Louis, because national defense priorities are greatly reducing the amount of fuel to be used for heating during the forthcoming winter. In connection with the shortage of both solid and liquid fuels, Laclede is emphasizing the ready amounts of gas for homeheating which will always be available, and offering special price and installation concessions to homeowners to use gas heat. A city news bulletin released concerning establishment of the anti-smoke ordinance in 1939 has already warned homeowners that it is wise to lay in a supply of fuel several months in advance of the winter season.

This sales meeting was the "opening gun" in the campaign, with "sick sales" as the outstanding features. All salesmen were issued white physician's hospital coats, with instructions to wear them throughout the two-day discussion. A concealed girl using a microphone called "Calling Surgery. Surgery!" during the meeting to add to the hospital atmosphere. "Instruments" issued to salesmen were figures on automatic heat in St. Louis, and comparative prices between gas, oil and stoker heating for the average Missouri winter.

The three heating experts operating the meeting were placed on a rostrum, on which was a "sick sale" wrapped in a white operating cloth. With all seriousness, R. Weddell and T. Steinson, officers of Laclede's househeating department, donned white coats for diagnosing the condition of the sick sale, which was a standard gas conversion burner beneath the sheet. Mr. Fagin was operating supervisor for the program.

The burner was uncovered, and a practical diagnosis was made on why any sale with it should be considered lost. Such "illnesses" as not qualifying the prospect, not analyzing sales properly, ignoring objections, and fear of competitive lower prices on other types of homeheating fuels were enumerated. Each objection was written on the blackboard; then "dissected" by a member of the staff, with practical answers for each of the problems as they came up. During the meeting, eight slide films were projected, demonstrating how to sell the prospect who has never experienced the advantages of home heating with gas.

Opening the meeting on the second day, Mr. Towne discussed the problems of oil burner and stoker-fired furnace competition, construction of each, and the advantages of gas in comparison. He compared the gas equipment's easy versatility with other types of automatic heat. In discussing stoker equipment he explained why it breaks down, and is costly in the long run. An oil burner was dissected, and the upkeep difficulties of this type of heating brought out. It was also brought out that heating problems for the winter of 1941 are sure to involve not only mechanical difficulties, but actual shortages of supply. The slogan "He who procrastinates will be cold this winter" was officially adopted by the "doctors" in attendance as their sales slogan for the year.

The last session was supervised by Alfred Hirsch, new general superintendent of Laclede, who stressed the point that there was a strong trend toward gas heat. Others on the closing session roster were H. F. Voertman and E. L. Ramsey.

Vitamins for defense
TRY THIS LOW COST
Full-Vitamin
DINNER
To build the best planes and man them with the best pilots, American health must be at its peak. That's why America is saving vitamins. Vitamins are America's best defense against attack by disease, epidemics or the weakness of poor health. Save the vitamins!
SAVE MORE VITAMINS WITH A CP GAS RANGE
FREE VITAMIN COOKBOOK
GAS APPLIANCE ASSOCIATION OF SAN DIEGO COUNTY

"Diets for Defense" Program Appeals to San Diego Women

In answer to an appeal from the San Diego County (Calif.) Federation of Women's Clubs for a course of study on consumer education and nutrition problems, the San Diego Gas and Electric Co., San Diego, Calif., is now sponsoring a "Diets For Defense" radio program under the direction of Mrs. Mildred Kier Townsend, home service director of the company.

"Diets For Defense," a 15-minute program which originates in the company's home service kitchen two mornings a week, is intended to help balance the grocery budget, show how to serve more nutritious meals for less money and promote better diets and consequently better health during national defense times.

A different women's club is featured on each broadcast and following the weekly programs, from 25 to 50 telephone replies asking for booklets giving more information on "Diets For Defense" have been received by the company.

Tying in with the radio program is the company's "Vitamins For Defense" local newspaper campaign currently in progress. (See cut.) These ads suggest inexpensive "full-vitamin" dinners, offer a free vitamin cookbook and tell how to save more vitamins with a CP gas range.

■ ■

Servel Christmas Poster To Be Seen Again This Year

Servel, Inc., Evansville, Ind., will repeat one of their outdoor posters used in the company's 1940 Christmas campaign. The poster dramatizes the Servel theme of "silence" by picturing two children in a human interest manner. Seasonal timeliness is brought in by the headline which reads, "Silent as a Christmas Candle," and the candle in the picture. The poster is in color with space for the dealer's name and address at the bottom.

"Temperature Times" Offers Plan to Get New Business

DEALER-SALESMEN in the automatic heating field were offered a systematic plan to get new business in the November issue of the *Temperature Times*, published by the Minneapolis-Honeywell Regulator Co., Minneapolis, Minn., for its dealers and salesmen. The seven-point plan, to be used in selling controls and systems, is as follows:

(1) Carefully prepare a list of all automatic heating installations in your territory. Use company, city, and fuel dealers' records in compiling the list.

(2) Supply your men with free inspection service blanks. (A " Check Sheet for Heating Efficiency" is prepared on this page of the *Temperature Times* as a model form.)

(3) Prepare a carefully worded explanation to be made to prospects regarding the free inspection service.

(4) Be sure all salesmen and service men are familiar with the plan mentioned above.

(5) Arrange prospects' names by territories and in rotation for consecutive calls in order to avoid extra traveling and waste of time.

(6) Supplement your salesmen's work with newspaper, radio or direct mail advertising.

(7) Have your men make estimates on the job at the time of the call and close the order then if possible. If the deal cannot be closed at that time, have them bring the estimate sheets in for checking and for immediate future follow-up by another call.

■ ■

Why Gas? Here's 10 Reasons

Ten advantages of gas were recently presented effectively in a counter card prepared by Peerless Manufacturing Corp., Louisville, Ky., for distribution to dealers of Peerless equipment throughout the country. The 10 reasons for using gas heat are:

Gas heat is clean and safe.
Gas heat is always available.
Pay for it after you use it.
No storage space required.
No delivery problems.
The only fully automatic heat.
The easiest to control manually.
One price and one quality.
Healthful—maintains even temperature.
Economical and highly efficient.

Accompanying the 10 selling points was a 10-line rhyme which tied in the company's line of products showing the advantages of gas heat. The rhyme, entitled "When Birds Fly South . . .," was illustrated by a color sketch showing three flying ducks.

■ ■

Phillips' New Patriotic Bank

Phillips Petroleum Co., Bartlesville, Okla., has supplied Phillips dealers with a number of novel glass banks which are designed to promote the sale of Phillips 66 gasoline and at the same time lend a helping hand to the cause of National Defense through the encouragement of public interest in saving.

The banks are 4¾ in. square and 3¼ in. wide, made of clear glass, with the Phillips Shield molded on each side and the words: "Phill-up with Phillips 66—See What You Save." Around the edge is a red, white, and blue band, with the United States Bond Price tables listed, and a suggestion to buy these bonds with the money saved from Buying Phillips 66. When filled the bank is easily opened and the two halves then may be used as ash trays or refrigerator dishes. It will hold approximately $10.00 in pennies, $32.00 in nickels, or $150.00 in dimes or quarters.

Educational Clock Control Campaign

AWARE that many women possessing clock-controlled gas ranges do not reap the fullest benefit from them and therefore do not live up to their potentialities as gas customers, Marguerite Scroggie, home service director of the Southern Counties Gas Co., Santa Monica, Calif., built a "personalized" promotional campaign to educate these women and show them the merits of *their* automatic clock control ranges.

MARGUERITE SCROGGIE

Deciding that the imaginative appeal through visualization was an impressive manner of appealing to women, she chose as the basic idea the "personalized" clock in the form of a little French maid (See cut).

Primary objective of the campaign was to inspire a sense of pride in ownership, and either create or revive greater interest in the use of the automatic clock-control. The plan was to send an oven-menu booklet which tied in with a set of five large cards to be mailed later. A card was sent out each week for five weeks, to almost 1000 selected owners of clock-controlled gas ranges. On each of these cards, the little French maid endeavored to put across a message (See cut). It was found that the cost averaged (including postage, addressing, etc.) about 17¢ per customer for the entire set of five cards, or about 3½¢ per card.

The campaign, says Mrs. Scroggie, not only increased gas load and lead to sales but was a fine public relations builder and mender. It offered a means of re-contacting the owner of a clock-controlled gas range after the gas company had completed the regular home service home call.

Inquiries resulting from the campaign were interesting. One woman mailed in the "Return" attachment on the fifth card saying: "My clock is three years old and has *never* worked." An investigation and an adjustment was made. The same woman is now enthusiastic about the way her clock control *does* work. Other women who had received the cards called in person at the gas company to get more instructions on how the clock control could be used.

Mrs. Scroggie states that the plan was sufficiently successful to warrant a continuation of at least the basic idea. The mailing list was made up of clock-controlled range purchasers for the past four years. A quicker and more intensive response would have been received, if the mailing list was composed solely of customers who had purchased their ranges within the preceding six months, said Mrs. Scroggie.

The campaign accomplished to an appreciable degree its eight objectives: (1) To renew contacts. (2) To uncover some grievances. (3) To make the housewife more aware of the appliance. (4) To get her to use the booklet and make it of real value. (5) To follow through on the home call with additional help. (6) To secure prospects. (7) To increase the use of the oven. (8) To publicize the company's home service department.

Did you?
YES
NO
LESSON 1..... COOK DINNER IN THE OVEN?
LESSON 2..... LET ME HELP WITH YOUR PARTY?
LESSON 3..... ENJOY CAREFREE HOURS?
LESSON 4..... PLACE DINNER IN THE OVEN AND NOT ON YOUR MIND?
LESSON 5..... LET ME COOK BREAKFAST?
P.S. HAVE YOU ANY FRIENDS WHO MIGHT BE INTERESTED IN CLOCK COOKING?
(please do not sign your name)
"If you have done any of these things, I am a happy little clock"

Natural Gas Serves Fort Ord

THE story of the construction of Fort Ord at Monterey, Calif., the Pacific Coast's newest Army cantonment, is proof of the ability of both the building and gas industries' ability to meet the most exacting requirements of national defense. Starting from bare sand dunes, this entire project, comprising some 547 buildings, was completed two days under the 90-day time limit. In fact, a record of one building per 54 minutes working time was established. Troops began moving in on December 6, 1940, completing their occupation on December 20.

Actual statistics reveal more tangible evidence of this accomplishment. Fort Ord includes the following:

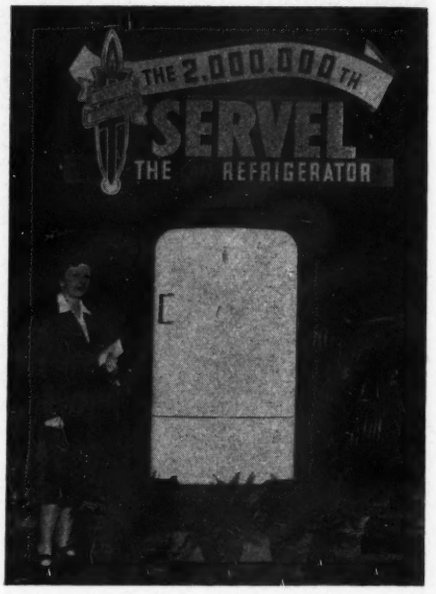
366—63-man barracks.
121—171-man mess halls.
9—250-man mess halls.
2—118 man mess halls.
1500—bed hospital unit—100 buildings.
37—officers' quarters.
20—headquarters buildings.
169—warehouses.
1—bakery.
1—cold storage plant.
1—laundry, 40,000 capacity.
142—recreation buildings.
3—theatres, 1000 capacity each.
116—miscellaneous buildings.

Thirty miles each of gas main, water main and sewers were installed, as well as 120 miles of primary and secondary wiring. For gas service, an 8½ mile, 10 in. high pressure, gas line was laid to the Fort by the Pacific Gas and Electric Co., of San Francisco, supplying fuel through a meter installation with a capacity of 500 ft. per hour. Incidentally, during the month of April, 1941, Fort Ord consumed more gas than the nearby city of Salinas (22,000 population).

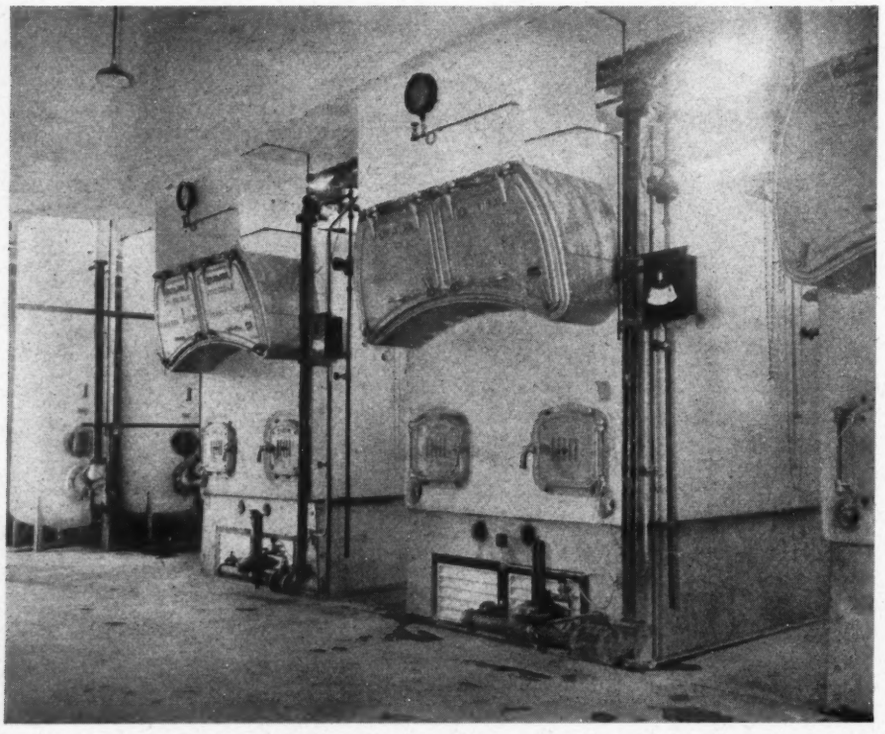
Paved primary roads on the cantonment measure 13 miles. Actual building materials consumed were 1245 carloads of lumber, 12,000 doors, 30,000 windows, 166 carloads of sheetrock, and 200,000 tons of paving materials.

In the matter of utilities for the comfort and convenience of its occupants, Fort Ord compares well with many of the large scale housing projects now being constructed. All equipment for heating, water heating and cooking is of the most modern gas-fired type. Barracks, company recreation buildings, post exchanges, guard houses, dispensaries and infirmaries are heated with automatic forced air gas furnaces which maintain year-around comfort under thermostatic control. Three theatres, each of 1000 capacity, are heated with gas-fired steam boilers, as are the five fire stations on the post. Automatic gas water heaters supply showers in the barracks. A completely modern laundry plant, with a 40,000-man capacity, is equipped with a fully automatic 750-hp. gas-fired steam boiler installation. The 1200 squad tents of the East Garrison are kept comfortable by means of gas circulating heaters. All mess kitchens are provided with the most up-to-date heavy duty gas ranges, deep fat fryers, and large storage water heaters. Gas equipment in the bakery consists of six 12x14 ft. indirect fired bake ovens and two boilers for heat and hot water.

Fort Ord is the home of the Seventh Division which, with its complement of corps troops, is being built to a strength of 29,000 men. Designed on the "regimental plan," the cantonment was built under the supervision of Lt. Colonel H. D. Stetson, Construction Quartermaster.



The 2,000,000th gas refrigerator from the assembly lines of Servel, Inc., at Evansville, Ind., is shown with Princess Alexandra Kropotkin, well-known author, in the lobby of an Evansville hotel where the refrigerator was placed on display for the people of that city. The Princess, who was on a lecture tour, inspected Servel's plant facilities as guest of Louis Ruthenburg, president of the company.



A completely modern laundry plant, with a 40,000-man capacity serves recently constructed Fort Ord at Monterey, Calif. Above is shown the 750-hp. gas-fired boiler installed in the laundry.

Tappan Stove Co. to Award Prizes for Holiday Displays

The Tappan Stove Co., Mansfield, Ohio, is offering Tappan gas range dealers an opportunity to cash in on Christmas promotion by sponsoring a $1500 holiday window display contest.

The contest will close December 31, and photographs of windows, accompanied by descriptive comments, will be judged on the basis of ownership appeal, originality, beauty, lighting, color, neatness and gift appeal.

Sixty-five awards, 13 to be given in each of the five dealer classes, total the $1500 in prize money. Utility companies, department stores, appliance stores, furniture stores and hardware and sundry stores make up the five dealer classes eligible for the contest. Five first prize of $100 each will be given.

San Francisco Salesmen Hear Speech on Vitamin Loss

HERB WATSON, sales counselor, Association of Gas Appliance & Equipment Manufacturers, who has recently held CP Range Sales meetings with Pacific Coast gas utilities, was guest speaker at the San Francisco Range Salesmen's dinner given by the San Francisco unit, Gas Appliance Society, October 23, at the Olympic Club. Mr. Watson stressed the importance of controlled gas cooking in preserving the natural vitamins in food.

San Francisco range salesmen were complimented on their leadership in the sale of ranges and their outstanding showing in the national CP Ranger Club activities which are sponsored by A.G.A.E.M.

Perry Spencer, of Frank Newman Co., was honored as the first dealer salesman to become a Star Ranger, and as one of the two men in San Francisco who is a third-year CP Ranger. Earl Whelan is the other third-year man. Frank Talcott, sales manager, San Francisco division, Pacific Gas and Electric Co., reported the growth of the CP Ranger Club from two men in 1929 to a total of 55 at the time of the dinner. Almost 150 men from 67 dealer firms attended the banquet.

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P.C.G.A. Advertising For Next Year Will Total $41,050

J. S. Spaulding, chairman of the Pacific Coast Gas Association cooperative advertising committee, has announced that the 1942 advertising budget totals $41,050. Subscribing companies for 1942 are Coast Counties Gas and Electric Co., Santa Cruz, Calif.; Pacific Gas and Electric Co., San Francisco; San Diego Gas and Electric Co., San Diego, Calif.; Southern California Gas Co., Los Angeles, and Southern Counties Gas Co., Los Angeles. Gerth-Knollin Advertising Agency will continue handling the account.

A total of more than 125 pages of advertisements will be used in almost a score of magazines directed to five specific groups. These groups are domestic consumers, architects and builders, commercial cooking customers, appliance dealers and shop and factory workers. The 1942 campaign marks the 14th consecutive year for this form of industry promotion by the cooperative advertising committee of P.C.G.A.

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Domestic Range Committee To Offer Four Campaigns in 1942

One of the features of the 1942 program of the Domestic Range Committee of the A.G.A. will be the presentation to the industry of four complete CP range sales campaigns especially designed to meet the local conditions of gas companies in various parts of the United States. The campaigns will be presented by the field representatives of A.G.A.E.M.

It was decided at the same meeting that the CP Ranger Club should be continued during the coming year with some simplifications. Another three months' Spring campaign with cash awards will be held in March, April and May. All expense trips to the next Annual Meeting of the American Gas Association will again be awarded to the utility sales leaders in each of the seven divisions of the competing companies. A national award and divisional trophies to the utilities which have done the best all-around CP range promotional jobs during the emergency will also be repeated.

Connelly Camera Contest Awards Made

C. J. CRAMER, of the Ohio Fuel Gas Co., Toledo, was the winner of the $100 grand prize awarded by the Connelly Iron Sponge and Governor Co., Chicago, Ill., in its 1941 Photographic Contest which closed recently. The contest, open to gas company employees and their families, provided for 18 cash prizes ranging from $3.00 to $100.00, according to R. W. Stafford, sales manager of the company who directed the contest.

Mr. C. J. Cramer of the Ohio Fuel Gas Company, Toledo, Ohio, won the grand prize of $100.00 with his photo of the Connelly "H_2S Tester" in the Connelly Photographic Contest.

Mr. Cramer's photograph was an unusual picture of a Connelly H_2S Tester in operation. The board of judges was composed of Samuel Insull, Jr., of Chicago, Lester Eck of Minneapolis Light and Gas Co., and Vernon G. Leach of Peabody Coal Co., Chicago.

Prizes of $25.00 each were awarded to Floyd Rogers, Albion (Mich.) Gas Light Co., for his "Purifier Manifold," and I. F. Patt, Providence (R. I.) Gas Co., for a photo entitled "Purifying Boxes"; while $10.00 prizes went to Russell Goodman, Portland (Ore.) Gas and Coke Co., and Grayum Davis, United Gas Corp., San Marcos, Texas.

Among other prize winners were Julien Jordan, Peoples Gas, Light and Coke Co., Chicago, Ill.; H. H. Crook, Citizens Gas and Coke Utility, Indianapolis; Herbert Kerr, Knoxville (Tenn.) Gas Co.; Albert Crownfield, Jr., Boston (Mass.) Consolidated Gas Co.; Leon J. Willien, Public Utilities Engineering and Service Corp., Chicago; H. J. Reichert, Michigan Consolidated Gas Co., Muskegon, Mich.; and C. J. Smith, South Carolina Power Co., Charleston, S. C.

California Co. Builds Six-Story Annex

Celebrating the completion of the new six-story annex to Southern California Gas Co.'s building at 810 So. Flower St., Los Angeles, over 2000 gas company people, accompanied by their families and friends, attended an open house which was held Friday evening, Nov. 14. The new building, a Class A reinforced concrete structure, houses general and executive offices as well as a new customer service department. The latter, an elaborate telephone installation operated by specially trained customer service women, is the first of its kind in the West and the most highly developed in the country. This system during one day in November handled 8000 customer service calls. Completely air conditioned by gas-fired equipment, the annex is modern in every feature. Among other features for use and convenience of the general public, it contains an auditorium and demonstration kitchen in the basement where a program of home service demonstrations is now in progress.

ASSOCIATION *Activities*

P. C. G. A. Announces Fall Sectional Appointments

THE Pacific Coast Gas Association, San Francisco, has announced several sectional appointments. J. E. Kern, general chairman of the sales and advertising section, will be assisted by the following lieutenants: R. J. Phillips, chairman of the domestic sales committee; Charles L. Ferry, chairman of the commercial and industrial sales committee, and Grace J. Meyer, chairman of the home service committee.

H. P. George, general chairman of the technical section, has secured the following assistants: Ralph L. Cook, chairman of the distribution committee; F. F. Doyle, chairman of the transmission committee; H. W. Geyer, chairman of the utilization committee. Regular directors of the manufacturers section are C. O. Menig, general chairman, and A. F. Rice. Alternates are E. L. Payne and R. G. Logue.

L. W. Coughlan, general chairman of the accounting section, has arranged for a series of specialized invitational meetings. The first of these was held in San Francisco, October 23-24, under the sponsorship of Harry McGann. Similar meetings will be held in Los Angeles, Santa Cruz, San Diego and Portland.

■ ■

Divisional Meetings Held by New England Gas Ass'n

A series of divisional meetings are now being held by the New England Gas Association. The Industrial and Commercial divisions met at the University Club in Boston on November 14. This group was addressed by Lemuel J. Rogers, of the Boston Consolidated Gas Co.; Walter G. Groth, of the Burkay Co., Toledo, Ohio, and Thomas P. Kelley, of Standard Gas Equipment Corp., Washington, D. C.

On November 25, the Accounting division met at the Hotel Narragansett, Providence, R. I., and heard speeches by Robert M. Brigham, Springfield Gas Light Co., Springfield, Mass.; Robert J. Daniels, New England Power Service Co., Augusta, Me., and R. C. Harrington, of Ernst & Ernst, Providence, R. I.

An Industrial division meeting is to be held at the Hotel Bancroft, Worcester, Mass., on December 12. George P. Beck, of the Minneapolis-Honeywell Regulator Co., Boston, and Herman G. Koester, Jr., associate of W. Wirt Young, will address the group.

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S. C. M. A. Holds Meeting

The Southern California Meter Association met at the French Cafe, Montebello, Calif., on November 27. The group was addressed by W. M. Henderson, superintendent of gas distribution, Southern California Gas Co., Los Angeles, on "The Installation and Operation of Pressure Fittings on High Pressure Gas Lines." Demonstrations of the fittings were given by J. D. Staples, district foreman of the Southern California Gas Co.

A. I. M. M. E. Meeting is Held in Los Angeles

The fall meeting of the American Institute of Mining and Metallurgical Engineers, Petroleum Division, was held in Los Angeles, October 29-30. An introductory address, titled "Geologic Setting For Occurrence of Oil in California" began the meeting. It was delivered by H. W. Hoots, chief geologist of the Richfield Oil Corp. W. H. Geis, assistant to the president of the Union Oil Co., presided at this session.

Chairmen for other sessions of the meeting were: E. K. Parks, Los Angeles engineering consultant; C. P. Watson, vice president of the Seaboard Oil Co., and John F. Dodge, head of the department of petroleum engineering, the University of Southern California. Between 450 and 500 A.I.M.M.E. members and guests were in attendance.

■ ■

San Francisco Is A. G. A. Convention City for 1942

San Francisco has been named convention city for the 1942 meeting of the American Gas Association. This will be the first time the national convention has been held in San Francisco since 1915, and more than 2500 delegates are expected to attend. The week of October 5 has been tentatively set for the meeting.

CALENDAR

December

National Industrial Council — Waldorf-Astoria Hotel, New York, N. Y., December 1-2.

American Society of Mechanical Engineers—Annual meeting, New York, N. Y., December 1-5.

Congress of American Industry — Waldorf-Astoria Hotel, New York, N. Y., December 1-5.

New Mexico Oil and Gas Association—Artesia, N. M., December 5.

Metropolitan House Heating and Air Conditioning Council Annual Meeting — New York, N. Y., December 10.

January

New England Gas Association, Operating Division — Round-table discussions, dinner, business session, Boston, Mass., January 14, 1942.

February

Southern Gas Association Annual Convention—Biltmore Hotel, Atlanta, Ga., February 9-11, 1942.

March

New England Gas Association, 16th Annual Business Conference — Hotel Statler, Boston, Mass., March 19-20, 1942.

April

Mid-West Gas Association—Sioux City, Iowa, April 13-15, 1942.

Gas Meters Association of Florida-Georgia—Savannah, Ga., April 19-21, 1942.

Southwestern Gas Measurement Short Course—College of Engineering, University of Oklahoma, Norman, Okla., April 21-23.

June

Canadian Gas Association, 35th Annual Meeting—Windsor Hotel, Montreal, Canada, June 4-5.

New Attendance Record Set At Fall C. N. G. A. Meeting

THE fall meeting of the California Natural Gasoline Association set a new high attendance record when it convened at the Ambassador hotel, Los Angeles, on October 31. The C.N.G.A. meeting immediately preceeded the A.P.I. annual meeting with only the week end intervening. Many A.P.I. members accepted C.N.G.A.'s open invitation to attend its meeting.

W. C. Dayhuff, president of the association, said that its greatest and most important function at the present time is to step up materially the extraction of isobutane. The inference throughout the meeting was that the California natural gasoline industry would be expected to greatly increase production of isobutane.

Paul Raigorodsky, in his paper, brought out the recent development of producing 100-octane aviation fuel by alkylation. Mr. Raigorodsky estimated that over 35,000 bbls. a day of butane can be made available in the natural gasoline industry for dehydrogenation or isomerization without substantial expenditure on the facilities for its production.

■ ■

Industrial Gas in Spotlight At National Metal Congress

With the A.G.A. Combined Industrial Gas Exhibit located in full view of all as they came through the main entrance, the Annual National Metal Congress & Exposition held the largest display of metal treating apparatus seen in many years in Philadelphia, October 20-24.

The Gas Exhibit portrayed the part gas and gas equipment is playing in arming the nation. All decorations and displays were white with blue trim and touches of red. The white theme was carried as far as having dozens of industrial burners and miscellaneous pieces of gas apparatus painted white, as were large annealing furnaces weighing six tons each and standing over seven feet high.

■ ■

Hotel Exposition Features Defense Kitchen Food Service

At the National Hotel Exposition, held at Grand Central Palace, New York City, November 10-14, the gas industry was offered an opportunity to present the latest in gas-fueled food service equipment to leading hotel and restaurant men engaged in both civilian and national defense work.

Through the medium of an A.G.A. Combined Gas Exhibit, organized and sponsored by the Industrial and Commercial Gas Section of the American Gas Association, the part gas is playing in large scale food preparation in national defense operations was highlighted.

■ ■

Southwestern Short Course Dates Set for April 21-23

Dates for the 1942 Southwestern Gas Measurement Short Course have been set for April 21-23, according to announcement by Miss Kate A. Niblack, secretary, Oklahoma Utilities Association.

The course will be held, as in former years, under direct sponsorship of the College of Engineering, University of Oklahoma, at Norman, Okla. The Oklahoma Utilities Association and other organizations will cooperate, according to W. H. Carson, dean of the college of engineering.

Panhandle Eastern to Build 166-Mile Michigan Line Soon

PANHANDLE Eastern Pipe Line Co., Kansas City, Mo., will begin construction soon on a pipe line approximately 166 miles long which will branch from the main trunk line near the Ohio-Michigan boundary line.

The new line will connect with Flint and Clawson, Mich. It will be laid in the vicinity of Pontiac and Saginaw, Mich. The line will consist of approximately 28 miles of 20-in., 25 miles of 18-in., 32 miles of 16-in., and 36 miles of 12-in. pipe. The line will be welded by H. C. Price Co.; I. C. Little is the general contractor.

The immediate program undertaken according to present plans will not include the 82-mile line extending west through Jackson and Marshall to Kalamazoo, Mich., which was contemplated this summer when Panhandle Eastern was making preliminary provisions for expanding its facilities. However, this line is slated for construction next year.

The company will proceed with the laying of 45 miles of 8-in. from Galesburg to Peoria, Ill., after pipe has been made available which the company is removing from its system in eastern Kansas. J. D. Cleveling, president of the Panhandle Eastern Pipe Line Co., said that his concern planned expenditures of $6,800,000 in 1942 for expanding its service in Michigan.

■ ■

New 400-HP. Compressor Unit Installed at Twitty, Texas

The Consolidated Gas Utilities Co., Oklahoma City, Okla., has completed installation of a 400-hp. Clark Bros. angle-type gas engine driven compressor unit in its compressor station at Twitty, near Shamrock, Texas.

The new unit will bring total capacity of the station to 1600 hp. Three 400-hp. units, designed by C. S. Worley, engineer of the company, had previously been installed in the plant. With the recent installation, the building has been extended to dimensions of 24 ft. by 80 ft. by 18 ft.

The new compressor unit will increase the capacity of the Consolidated Gas Utilities Co.'s 14-in. line carrying natural gas from points in Texas and through northern Oklahoma into central Kansas. It is expected to take care of a general increase in load demands on the line.

■ ■

Gas Line to Higley Airport Is Constructed In Arizona

Work has begun on the laying of a 16½ mile pipe line to serve gas to the Higley air base, near Chandler, Ariz. The central Arizona Light and Power Co., Phoenix, Ariz., is constructing the line which will consist of 7 and 4½-in. pipe. T. J. Frost, district manager of the gas company, is in charge of the construction of the line.

■ ■

Plans For $25,000,000 Pipe Line Are Formulated

Construction of a $25,000,000 pipe line from Monroe, La., to Charleston, W. Va., is contemplated by the Hope Natural Gas Co., Clarksburg, W. Va., according to an announcement made in Washington recently.

The announcement is said to have been made during a federal power commission hearing on the application of Cleveland and Akron, Ohio, and other cities for a reduction in the company's wholesale rates. The pipe line plans were contingent upon commission approval and the ability of the company to obtain priorities for material, it was said.

■ ■

Gas Purification Plant Built In Magnolia Field, Arkansas

In the Magnolia field, Columbia county, Arkansas, the Lion Oil Refining Co. has recently completed a plant which provides for the removal of hydrogen sulphide and carbon dioxide from 15,000,000 cu. ft. of natural gas daily.

The gas being treated is residue gas from the gasoline plant of the Shell Oil Co., Inc., in the Magnolia field, and from the Village field, about 6 miles distant. The latter gas is obtained direct from field separators. Principal volume at present is from the Magnolia field.

Gas from both areas is high in hydrogen sulphide content. Magnolia field gas contains 1350 grains per 100 cu. ft. and Village field gas 220 grains.

■ ■

Canadian System To Expand To Meet Increase In Gas Use

The Northwestern Utilities, Ltd., Edmonton, Alberta, Canada, has begun construction on the duplication of 7 miles of the company's main transmission line from the Viking field to Edmonton. The work was planned earlier as part of the company's $500,000 construction program, but has been delayed through difficulty in securing the necessary 12¾-in. pipe. The company drilled five new wells in the Kinsella field which aggregated potential of 71,000,000 cu. ft.

■ ■

Roper Corp. Defense Plant

The Geo. D. Roper Corp., Rockford, Ill., is now building a new $500,000 defense plant. The plant will manufacture 75 millimeter armor piercing shot for the United States Army. About 300 people will be employed in the plant.

Natural Gas Reserves Equal Total California Production

DIFFERING greatly from crude-oil reserves in California, the available supply of natural gas for future production is equal to or slightly exceeds the total production of natural gas from oil fields and dry gas fields to date. This fact assures natural gas distributors an adequate supply for a number of years to come. The state has produced 7,837,582,539,000 cu. ft. of gas to date.

Gas waste in that state during the first six months of this year is only 3.6% of the total production during that period. This is the lowest percentage of gas waste recorded in California since natural gas was first put to commercial use. The amount of natural gas wasted or unconserved has been progressively reduced for the past 10 years.

Most of the natural gas produced to date in California has come from fields producing crude oil, and although Los Angeles Basin fields still lead in production, it is anticipated that the San Joaquin Valley group will be ahead this time next year.

More than 50% of the total production of natural gas from oil fields in Los Angeles Basin was produced in the nine-year period from 1923-1931, inclusive. During this time a total of 1,879,704,966,000 cu. ft. was produced. Production of the coastal district has been relatively stable during the past decade, but production of fields in the San Joaquin Valley area has been at the peak during the past 10 years.

■ ■

New Booster Plant Built For Mississippi River Fuel Corp.

The Mississippi River Fuel Corp., St. Louis, Mo., now has a new $150,000 booster station on the natural gas pipe line near the junction of highways 67 and 14. The plant will increase the pressure in the line which extends from Monroe, La., to the industrial area of East St. Louis.

Construction of the booster plant was necessitated by the large increase in gas consumption in the industrial plants of East St. Louis, Alton, Madison and other cities.

For the fourth time in five years Minneapolis-Honeywell Regulator Co., Minneapolis, Minn., is building an addition to its plant in that city, according to an announcement by C. B. Sweatt, vice president in charge of sales. Rising four stories above the north wing just completed last year, the 65,000 sq. ft. of added floor space is necessary because of recent defense orders.

INDUSTRY *Personalities*

Announcement is made of the appointment of **Carl A. Goth** as heating engineer for the United States Government, with headquarters at Omaha, Neb. Mr. Goth will design and supervise installation of heating systems for government building projects now under construction. Since 1938, Mr. Goth has been heating sales engineer for the Iowa City Light and Power Co., Iowa City, Iowa. He had previously been air conditioning and heating engineer for Adams Wholesalers, Waterloo, Iowa, and heating engineer for the Iowa-Nebraska Light and Power Co., Lincoln, Neb..

• •

C. L. Follmer, manager of the rate research department of the Consolidated Electric Light & Power Co. of Baltimore, Baltimore, Md., has been reappointed chairman of the rate committee of the American Gas Association for the term, 1941-42. After graduation from Cornell University in 1910, Mr. Follmer spent five years in the power and mechanical department of the Consolidated Coal Co., Fairmont, W. Va., engaged in power plant design and engineering work. The following two years he was assistant to the chief engineer of the Hooker Electrochemical Co., Niagara Falls, N. Y. Since 1924, Mr. Follmer has been associated with the Consolidated Gas, Electric Light and Power Co. of Baltimore and has served as manager of the rate research department since 1938.

• •

N. J. Clarke, vice president in charge of sales for Republic Steel Corp., Cleveland, Ohio, has been named president of the Republic Supply Co., it is announced by **R. J. Wysor,** president of Republic Steel. Mr. Wysor also announced that **A. B. Judd,** vice president, has been elected general manager of the Republic Supply Co. Other officers of Republic Supply are: **J. H. Brooks,** vice president; **J. H. Lollar, Jr.,** secretary-treasurer, and **J. P. Lawrence,** assistant secretary-treasurer. Mr. Clarke will continue to make Cleveland his headquarters.

• •

The Blaw-Knox Co., Pittsburgh, Pa., has announced the appointment of **Edwin A. Wert** as vice president in charge of engineering and sales of its power piping division. The new divisional executive, taking the position held until recently by **S. J. Horrell,** has been a consultant for the company for a number of years. Mr. Wert, a graduate of the University of California, was an instructor in the U. S. Air Corps during the last war and is a member of the American Society of Mechanical Engineers, and has served as a lecturer at the Detroit Institute of Technology.

• •

M. R. THOMPSON

M. R. Thompson, vice president, Southern Counties Gas Co., Los Angeles, Calif., retired from active service under the company's retirement plan on December 1 after serving as engineer, vice president and director. He became an employee of the company on April 1, 1911, when the company's service was confined to the communities of Whittier and Santa Ana, Calif. The greatest portion of the Southern Counties system, as it exists today, was constructed under his supervision. An engineering achievement for which he is known in the industry was the development of the high pressure gas storage holder, which he perfected in collaboration with **Arthur F. Bridge,** vice president and general manager of the company. Fellow executives honored him at a dinner given at the Biltmore hotel, Los Angeles, on the evening of November 28.

• •

Three executives of the Pittsburgh Equitable Meter Co., Pittsburgh, Pa., have recently been called for active military duty. **Col. W. F. Rockwell,** president of the company, has reported to Washington, D. C., where he is serving as assistant to the Chief of the Motor Transport Division.

Capt. A. E. Higgins, vice president of the company, has been temporarily deferred from active duty in the air corps due to National Defense activities in which the Pittsburgh firm is engaged.

For the past eight months, **Capt. J. R. Sproat** of the company's sales staff, has been serving with the 176th Field Artillery in command of Battery "F" at Fort Meade.

• •

Lloyd P. Dolan, recently succeeded **L. L. Hennessy** as superintendent of the order department of the San Diego Gas and Electric Co., San Diego, Calif. Mr. Dolan was first employed by the company in 1923 as a trouble clerk in the gas distribution department. In 1926 he resigned from the company and after an absence of two years returned, as clerk in the gas meter shop. He was transferred to the order department in 1929.

• •

John H. Kunkel has been appointed director of public relations and advertising for The Fluor Corp., Ltd., of Los Angeles, designers, engineers and constructors for the oil, gas and allied industries, and manufacturers of cooling towers, mufflers and gas cleaners. Mr. Kunkel comes to Fluor with 20 years of advertising and public relation experience in industrial and technological fields.

• •

Leon B. Jones, managing director of the Jones Gas Process Co., Ltd., 289a Terminal House, Grosvenor Gardens, London, S. W. I., England, in a recent letter received by *GAS* wishes to extend greetings to all his friends in the gas industry in the United States, and to assure them of his safety. Mr. Jones was selected to build a gas plant in Wales before

HERE ARE SOME OF THE NATIONAL DEFENSE PROJECTS WHERE WEBSTER ENGINEERED COMBUSTION EQUIPMENT IS BEING INSTALLED

Bowman Field, Louisville, Ky. . . . Camp Livingston, Alexandria, La. . . . Camp Claiborne, Alexandria, La. . . . Camp Polk, Leesville, La. . . . Camp Wolters, Mineral Wells, Texas . . . Spartan School of Aeronautics, Tulsa, Okla. . . . Fort Sill, Lawton, Okla. . . . Camp Wallace, Hitchcock, Texas . . . Camp Bowie, Brownwood, Texas . . . Lukens Steel Co., Coatsville, Pa. . . . Baytown Ordnance Works (Toluene Plant), Baytown, Texas . . . U. S. Naval Air Base, Corpus Christi, Texas . . . Fort Benning, Columbus, Ga. . . . Air Corps Basic Training School, Montgomery, Ala. . . . Air Corps Bomber Base, New Orleans, La. . . . U. S. Naval Reserve Aviation Base, New Orleans, La. . . . O'Reilly General Hospital (U. S. Army), Springfield, Mo. . . . U. S. Air Base, Baton Rouge, La. . . . Brookley Field, Mobile, Ala. . . . Minneapolis Moline Power Implement Co., Minneapolis, Minn. . . . Aviation Mechanics Training School, Wichita Falls, Texas . . . Maxwell Field, Selma, Ala. Camp Barkley, Abilene, Texas . . . Quartermaster Depot, New Orleans, La. . . . U. S. Naval Reserve Aviation Base, Minneapolis, Minn. . . . Camp Beauregard, Alexandria, La. Air Corps Flexible Gunnery School, Harlingen, Texas . . . Air Corps Basic Training School, Mission, Texas . . . Camp Grayson, Pottsboro, Texas . . . Randolph Field, Texas . . . Atlas Powder Co., Atlas, Mo. . . . U. S. Naval Ordnance Plant, Canton, Ohio . . . U. S. Air Base, De Ridder, La. . . . Spartan Aircraft Co., Tulsa, Okla. . . . Fisher Memphis Aircraft Division, Memphis, Tenn. . . . Bomber Assembly Plant, Tulsa, Okla. . . . Fort Snelling, Minneapolis, Minn. . . . U. S. Naval Ordnance Plant, Louisville, Ky. . . . National Enameling & Stamping Co., Granite City, Ill. . . . National Enameling & Stamping Co., Jacksonville, Ill. . . . . York Ice Machinery Co., Akron, Ohio . . . . R. J. Dorn Co., Inc., New Orleans, La. . . . Aluminum Ore Co., East St. Louis, Ill. . . . Louisiana Ordnance Plant, Minden, La. . . . Fort Bliss, El Paso, Texas . . . Blaw-Knox Co., Plainville, Ky. . . . Standard Oil Co. of California, Richmond, Calif. . . . Pennsylvania Industrial Chemical Co., Clairton, Pa.

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TULSA *Division of* **OKLAHOMA**

SURFACE COMBUSTION CORP., Toledo, Ohio

F. J. Evans Engineering Co., Birmingham, Atlanta and Houston

Catlett Engineers, Inc., Dallas **Frank P. Fischer Engineering Co., New Orleans**

the war. After the war began, his services were commandeered by the British government in putting gas property that has been crippled by air raids back into service. Mr. Jones is a son of the inventor of the Oil Gas Process.

• •

Robert E. Easton, president of the Santa Maria (Calif.) Gas Co., which was merged with Southern Counties Gas Co., Los Angeles, in October, retired from active service on November 1 under the company's uniform retirement plan. He will continue to serve as a director of Southern Counties Gas Co. Mr. Easton joined the Santa Maria company as secretary-manager in 1909, three years after it began the service of natural gas to the City of Santa Maria. He became president of the company in 1929. **Allen T. Fesler,** who has held the position of general superintendent of the same company for many years, is now district manager. He is succeeded as general superintendent by **Robert B. Bruce.**

Mr. Easton has been active in the Santa Maria business community since 1899. He was one of the organizers of the Home Telephone Co. and after its merger with the Santa Barbara Telephone Co., became president of the latter organization. When it was absorbed by the Associated Telephone Co. in 1939, he became a vice president and director of that company.

• •

John Ross, general accountant for the Citizens Gas and Coke Utility, Indianapolis, Ind., for the past five years, has been promoted to assistant auditor. He succeeds **C. S. Steward** who died recently.

Besides his general accounting work Mr. Ross audits books and prepares tax returns for the Utility's coal mine at Milburn, W. Va. Prior to 1936 he was connected for nine years with Ernst & Ernst, national firm of Public Accountants.

• •

C. O. Menig, vice president of Pacific Gas Radiator Co., Huntington Park, Calif., manufacturer of gas-fired heating equipment, has been appointed to serve on a special advisory panel by Leon Henderson, Administrator of the Office of Price Administration and Civilian Supply. (See Page 18.)

The advisory panel is made up of executives selected from the domestic cooking and heating appliance industry. Its purpose is to attend meetings in Washington and to supply qualified advice on problems relating to price.

• •

Jack T. Williams, former secretary-treasurer of the Southern Gas Co., Kilgore, Texas, has been promoted to the office of manager of the Longview, Texas, branch of the company, succeeding **H. G. Chambers,** resigned. Mr. Williams is a graduate of Cumberland University.

• •

Walter T. Gleason has been appointed gas superintendent of the Iowa-Nebraska Light & Power Co. for Aurora and Hampton, Neb. Mr. Gleason has been an employee of the company since 1929 and was district foreman prior to his present promotion.

• •

Earl Stevenson, formerly located in the Monroe, La., district of the United Gas Corp., has been transferred to the company's offices at Houston, Texas.

Wedding bells rang last month for **W. H. Vogan,** manager of the Pacific Coast branch of the American Gas Association Testing Laboratories, Los Angeles, and **Miss Thelma Shomler,** of Santa Monica, shown above at the marriage bureau in Los Angeles. The bride is also a member of the gas industry, having served for several years as secretary in the publicity department of the Southern California Gas Co. Mr. Vogan has been with the Testing Laboratories 13 years, coming to Los Angeles from the Cleveland Laboratory in 1939.

• •

R. A. Crawford, vice president and director of the Lone Star Gas Co., Dallas, Texas, has resigned. Mr. Crawford has been vice president of the firm for 20 years.

• •

George Myers, of Jackson, Miss., former district construction foreman of the United

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Connelly IRON SPONGE

Gas Pine Line Co., Houston, Texas, has succeeded **L. P. Mullin** as section manager of the Jackson, Miss., division of the company.

• •

C. Benson Dushane, Jr., is the new manager of the Mid-West territory for the American Meter Co., and with headquarters in Chicago (instead of Los Angeles, as incorrectly reported in the November issue of *GAS* in connection with Mr. Dushane's promotion). An employee of the company for 21 years, Mr. Dushane received technical training at the Baltimore Institute of Technology, Johns Hopkins University and Massachusetts Institute of Technology. He is a member of the American Gas Association, a past president of the Mid-West Gas Association, and a permanent member of its executive board.

• •

Herman Jones, Dallas, Texas, has been named director of the gas utilities division of the Texas Railroad Commission, succeeding **Clinton Owsley** who was made director of production in the oil and gas division. Other personnel changes in the gas utilities division were: **David Henderson** of Austin was made acting chief valuation accountant in the gas utilities division, and **W. V. Gist** of Winnsboro became senior accountant. **C. F. Petet,** secretary of the commission, was transferred to inspector and operating service expert, and was succeeded by **Ted Read** as secretary.

• •

W. A. Mineo, manager of the Oklahoma Natural Gas Co. office at Edmond, Okla., retired from service recently. Mr. Mineo has been in the gas business for 33 years and has been local manager in Edmond for 29 years. Before this time he was employed by the Porter Gas Co., Porter, Okla., and the Oklahoma Fuel Supply Co. In 1939 he was presented with a watch by Oklahoma Natural for his service to the company. **C. L. Dalton,** of Oklahoma City, will replace Mr. Mineo in Edmond. Mr. Dalton has been connected with the company since 1928.

• •

R. E. Clements, Amarillo, Texas, has been elected president of the newly organized Liquefied Gas Association, which embraces the liquefied gas industry of Texas, New Mexico, Oklahoma, Kansas and Colorado.

• •

George Hawkins, formerly of Denison, Texas, has taken over the duties of subdistrict manager of the Community Natural Gas Co., at Marietta, Okla., according to an announcement by **Charles Barndt,** district manager of the Sulphur office of the company. Mr. Hawkins succeeds **Ernest Holloway,** resigned.

• •

W. R. Porterfield, Jr., has been appointed junior industrial engineer for the Waco, Texas, division of Texas Cities and Community Natural Gas companies. He was formerly gas superintendent for Louisiana Public Utilities Co., Lafayette, La., before accepting his new duties.

• •

Frederick U. Conard has been elected a director of the Hartford Gas Co., Hartford, Conn., to fill a vacancy recently created by the resignation of **Harold R. Sterrett.** Mr. Conard has been an employee of the Public Service Gas and Electric Co., Newark, N. J.

John A. O'Brien has been elected to the post of vice president of Johns-Manville Corp., New York, N. Y., according to an announcement by **Lewis H. Brown,** president of the company. Mr. O'Brien has been general sales manager of the power products and industrial department since 1938 and will continue his duties in that capacity.

• •

T. B. Sudderth has resigned as vice president and general manager of the Euncie Gas Co., Hobbs, N. M. **Dwight P. Teed,** secretary, has been elected to the board of directors, and **B. W. Jarboe** has been appointed general field superintendent.

• •

C. V. Sorenson, of the Midland Utilities Co., Hammond, Ind., has been named chairman of the American Gas Association Refrigeration Committee succeeding **B. T. Franck,** vice president of the Milwaukee Gas Light Co., Milwaukee, Wis.

• •

F. W. Stone, vice president and general manager of the Lake Shore Gas Co., Ashtabula, Ohio, retired recently after serving 44 years as an executive and official. His successor is **Glenn C. Wilhide,** of Ashtabula.

• •

Basil G. Johnson is now manager of the Walters district of the Community Natural Gas Co., Dallas, Texas. He replaces **J. A. Hayes,** who has been transferred to Wichita Falls, Texas, as plant superintendent.

• •

Frank C. Smith, president of the Houston Natural Gas Corp., Houston, Texas, has been elected chairman of the board of directors of the Texas College of Arts and Industries at Kingsville, Texas.

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Obituaries

C. C. Crum

Constant C. Crum, 65, retired superintendent of the Binghamton Gas Works, died in Binghamton, N. Y., recently following a year's illness. Mr. Crum, who retired last July, had been employed by the Binghamton Gas Works for 27 years.

• •

W. H. Hedges

William Henry Hedges, 81, retired foreman and meter expert for the Ohio Fuel Gas Co., Marion, Ohio, died recently. Mr. Hedges was an employee of the gas company from 1901 to 1929.

• •

L. A. Meyran

Louis A. Meyran, 82, vice president of the Manufacturers Light & Heat Co., Pittsburgh, Pa., died recently. Mr. Meyran was a graduate of the University of Heidelburg.

• •

H. C. Potts

Henry Collins Potts, vice president, Kerotest Manufacturing Co., Pittsburgh, Pa., and an active figure in the American Petroleum Institute, died suddenly in Washington, D. C.

• •

E. W. Hodges

Earle W. Hodges, public relations official of the New York office of The Gas Service Co., Kansas City, Mo., died recently.

Two New Standards Adopted By Requirements Committee

AT the 48th meeting of the American Gas Association's Approval Requirements Committee, held recently in Atlantic City, two sets of standards were reviewed and approved. These include a revised edition of American Standards for gas-fired refrigerators and initial requirements for flexible metal tubing and fittings for gas appliance connectors. Both are being placed in the hands of the American Standards Association for acceptance as American Standard.

In view of the action taken by the Office of Price Administration in requesting development of Defense Emergency Standards for Automatic Refrigerators, availability of revised gas refrigerator requirements is particularly significant. They anticipate the need for general standardization of automatic refrigeration. All sections of these requirements have been brought up to date with recent developments and improvements in gas refrigerators.

Adoption of Listing Requirements for Gas Appliance Connectors of Flexible Metal Tubing and Fittings make available for the first time equitable means for testing a new type of accessory which is rapidly becoming more and more popular throughout the United States. Performance tests covering safety and durability under severest operating conditions will assure consumers of safe and satisfactory service from this type of equipment.

■ ■

Arkansas Commission Favors Gas Companies' Merger

The Arkansas State Utilities Commission would favor consolidation of the Ft. Smith Gas Co. and the Southern Gas Producing Co., Ft. Smith, Ark., controlled by the United Public Utilities Corp. (Chicago), with six other companies producing and transporting natural gas in the vicinity of Ft. Smith if the United Public is forced to dispose of its holdings.

The Federal Securities Commission has begun proceedings to bring the United Public system within geographic limitations of the 1935 holding company act. Hearing has been set for December 22 in Washington. On invitation of the federal group the state commission said it did not care to participate in the case but suggested the consolidation.

■ ■

Continental Water Heater Co. Moves Into New Quarters

The Continental Water Heater Co., Ltd., with headquarters in Los Angeles, Calif., will move into its new building at 1801 Pasadena Ave., Los Angeles, this month. An open house celebration has been planned for December 13, according to an announcement by Wayne R. Smith, vice president of the company. The new building, on an acre and a half site, has 25,000 sq. ft., modern lighting and show window facilities. The company has warehouses and sales representatives in New Orleans, Fort Worth, Kansas City, San Francisco, and Seattle.

■ ■

Willmar Gas Co. Has Added A Meter a Week for 13 Years

Organized in October, 1928, the Willmar Gas Co., Willmar, Minn., was serving 482 meters a year later. Today the company has over 1200 meters, averaging more than a meter a week since its beginning.

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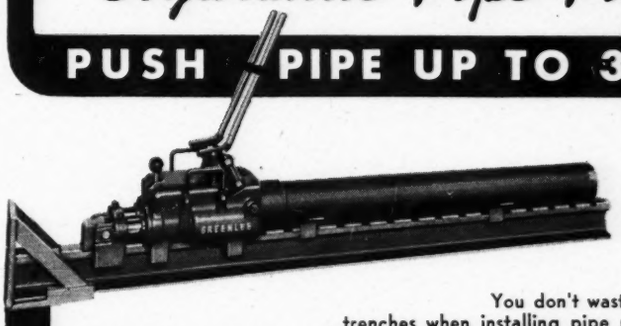

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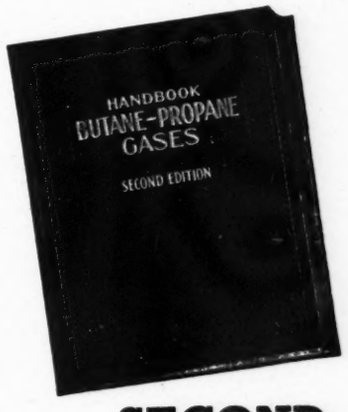

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The Natural Gas Magazine

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CURRENT Reading

EACH MONTH a competent staff reviews more than 70 publications serving the gas, oil and affiliated industries in a search for those published articles of value to technicians and executives in the gas industry. In this department of GAS, brief abstracts of such articles are presented.

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Technical

Technical Research By the Bureau of Mines in Oil and Gas Production, Refining, and Utilization—By H. C. Miller and G. B. Shea. United States Department of the Interior, Bureau of Mines, Information Circular I.C.7173. At present the Bureau's work on oil and gas production problems is placing major emphasis on the fluid and energy relations in petroleum reservoirs. The information is meager on fundamental relationships of oil and gas in reservoir sands and rocks, the mechanics of their flow to wells through the porous mediums in which they occur, and the energy relations involved in the various stages of flow from reservoir formations to the tanks at the surface. Accordingly, this program of research is aimed "to give the industry a better picture than it now has of the fluids and the energy in, or associated with, natural petroleum reservoirs and the way in which the available energy can be used to the greatest advantage in obtaining efficiency and optimum recovery." The Bureau's studies in petroleum chemistry and refining relate chiefly to more efficient utilization of petroleum through greater knowledge of its constitution and transformation into merchantable products. In conducting this part of its research, the Bureau has kept in mind future needs as well as immediate requirements.

The Dielectric Strength of Glass—An Engineering Viewpoint—E. B. Shand. The study is organized under three main headings: (1, Dielectric failure of glass, (2) Factors governing failure, (3) Curve data. Tables and data curves include disruptive strength; graphic representation of breakdown characteristics; selected dielectric breakdown data for glass; selected breakdown data for porcelain; oil puncture tests on power insulators; dielectric breakdown characteristics of "Pyrex" glass and porcelain. Mr. Shand's study was recommended by the AIEE committee on basic sciences and was presented at the AIEE North Eastern District spring meeting at Rochester, N. Y. Copies of the paper may be obtained, without obligation, from the Insulation Division, Corning Glass Works, Corning, N. Y.

Petroleum Facts and Figures — 1941; 192 pages; paper; tables and charts; published by American Petroleum Institute, 50 W. 50th St., New York; $1.00. Seventh edition of annual statistical report on the American petroleum industry presenting data on utilization, production, refining, transportation and marketing of petroleum and its products throughout the world, and additional data on prices and taxation, general operations of the industry. Includes a table contrasting industry capacities in 1940 and 1917, a complete list of tank ships flying the American flag, and more than 200 other tables, many of which incorporate 1940 data. New features include a pictorial section and a statistical section which includes all world data.

Electrode Consumption Calculator—Published by Air Reduction, 60 East 42nd St., New York, N. Y. Cost of arc welding electrodes can be estimated for welding any type of joint on any thickness with either bare or coated electrodes by the use of this booklet, which tells how many pounds of electrodes are required per linear foot of weld. The calculator includes consumption figures for both bare and shielded arc electrodes on all metal thicknesses commonly employed in making fillet welds, square welds, square groove butt joints, "V" and "U" groove butt joints, bevel grooves and "J" grooves. The amount of steel deposited per linear foot of weld is also shown. Copies of the booklet can be obtained by writing to Air Reduction.

Fundamentals of Automatic Flash Tube Lighter Design—Bulletin No. 14—By the American Gas Association Laboratories. The third bulletin issued by the Laboratories on domestic gas range research. Detailed data is presented on principles of lighter design, including size and location of flash tubes with relation to burner and lighter prots, and their effect on satisfactory ignition. Characteristics of fuel gases as they affect lighter design, based on results of extensive tests are covered. Copies of the bulletin may be obtained at $1.25 each plus postage from the American Gas Association Testing Laboratories, 1032 East 62nd St., Cleveland, Ohio.

Application of Gas Fuel to Heating Boilers—R. L. Grutzmacher. *Heating, Piping and Air Conditioning*, Oct., 1941, pp. 659-665. The use of gas for heating boilers is not new. The problem of burner design and application have been discussed in other reports. For purposes of this discussion, the developments of burners are summarized to emphasize the relationship of burner design and arrangement to automatic control.

Cooperative Repressuring of Loma Novia Field—T. Davison. *Oil Weekly*, Oct. 20, 1941, pp. 17, etc. The first year of repressuring at Loma Novia, Texas, shows promise of good final results. This project is particularly interesting for two reasons. First, it is unusual in that 12 operators hav-

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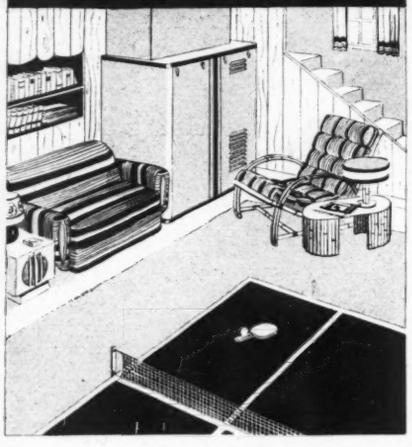

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ing 30 small leases in a field can cooperate in a repressuring program, disregarding property lines in the selection of key wells and input volumes. Second, the program is unusual because only the excess power from the pumping engines is used to drive the compressors.

Gasolines from Processing Gas Condensate—Davis Read, Jr., and Gustav Egloff. *Oil and Gas Journal*, Oct. 16, 1941, pp. 49, etc. Recovery of gas condensate in the recycling operation of deep fields has been steadily increasing. These gas-condensates contain hydrocarbons that can be readily converted into aviation gasoline components by isomerization and alkylation. Tables: Properties of distillate stock; Fractionation of distillate stock; Reforming results—Dubbs pilot plant; Complete analysis of reforming-plant gas and gasoline; Laboratory debutanization of reformed gasolines; Aviation-gasoline blend; Motor fuel blending yields and proportions in blends; Motor fuel blending properties of blends and components.

Effect of High-Voltage Discharge on Thermal Decomposition of Ethane—I. H. Parrill and W. G. Eversole. *Industrial and Engineering Chemistry*, Oct., 1941, pp. 1316, 1317. Ethane is decomposed to ethylene and hydrogen in the glow discharges. Methane production becomes greater at higher temperatures and higher energy input. Decomposition of ethane occurs in the glow discharge, yielding decomposition products corresponding to those obtained by thermal action at 300° C. higher temperature. Decomposition proceeds at temperatures as low as 100° C.

Elementary Principles of Corrosion Throw Light on Prevention — Randall Mass, General Petroleum Corporation. *California Oil World*, 2nd Oct. issue, 1941, p. 9-16. The object of this paper is to discuss the general elementary principles of corrosion with a view towards creating a better understanding of the important problems of corrosion prevention. Corrosion reactions may be divided into two general classes: that is, those occurring in conducting mediums (such as water), and those occurring in non-conducting mediums (such as gases).

Gas Explosions in Buildings—Their Cause and Prevention—Information Circular 7142R of Bureau of Mines, United States Department of the Interior, October, 1941. Prepared by D. J. Parker and C. W. Owings. Discusses related properties of fuel gases; describes recent gas explosions in dwellings, schools and various public buildings; lists the apparent contributory causes, and recommendation for avoidance.

Pressure-Maintenance Project Conserves Reservoir Energy—Neil Williams. *Oil and Gas Journal*, Oct. 2, 1941, pp. 30-31. Bottom-hole pressure in the Driscoll Ranch pool of Duval County, Texas, has been stabilized by the injection of 2,500,000,000 cu. ft. of gas in the past year and a half. Prolonged flowing life of the wells is insured by the project. Described and illustrated.

Inspection of Welding for a Large-Diameter Pipe Line—Paul Reed. *Oil and Gas Journal*, Oct. 9, 1941, pp. 38, etc. Welding practices and the inspection of welds and welders are included in this digest of the specifications for a large-diameter line which was recently constructed.

New Arc-Welding Practices in Pipe-Line Construction — A. F. Davis. *Oil and Gas Journal*, Sept. 18, 1941, pp. 192, 193. Several new practices are to be noted in present-day procedure in the construction of pipe lines by arc welding. These new practices are: 1. Increasing use of plain butt joints welded without backing-up ring in large diameter pipe. 2. Use of high-tensile steel pipe. 3. Increasing use of diesel engine-driven arc-welding machines.

New Practices Used in Laying 400 Miles of 26-in. Pipe—Paul Reed. *Oil and Gas Journal*, Oct. 30, 1941, pp. 37, etc. Outstanding pipe-line project so far this year has been the 403 miles of 26-in. line laid by Natural Gas Pipeline Co. of America. Wall thickness of the pipe was reduced, factory bends were used, and special practices were developed in the laying of this line. The methods introduced may have a large effect on future construction.

General

Done in Oil—By David D. Leven; 1084 pages; cloth; tables, charts, graphs, line-drawings, and half-tones; published by Carldon Publishers, 54 Lafayette St., New York, N. Y.; $10.00. One of the most comprehensive, understandable, and practical treatises on the petroleum industry to be written in recent years, the book considers the industry and its work in the world from the practical, economic, and financial standpoints.

An extensive index, a petroleum glossary, and a bibliography, with photographic illustrations by Robert Yarnall Richie and a series of pertinent maps, some of which are in color, charts, tables, and graphs, contribute greatly to the usefulness of the book. Time may demonstrate that this one-volume petroleum library is essential equipment.

Eye Hazards in Industry—Louis Resnick; 321 pages; 33 illustrations; 13 tables and two charts. Published by the Columbia University Press. Book is divided into two parts: The Problem and The Solution. Chapters of the publication are titled: Eye Hazards; Eye Accidents; Eye Diseases; Defective Vision; First Aid; Mechanical Guards; Process Revision; Proper Lighting; Education and Administrative Supervision. The author, Mr. Resnick, is the late Director of Industrial Relations, National Society for the Prevention of Blindness. Preface is by Lewis H. Carris, Director Emeritus, National Society for the Prevention of Blindness. Price $3.50.

How to Keep Wage and Hour Records Under the Fair Labor Standards Act of 1938—Published by the United States Department of Labor, Wage and Hour Division. Divisions of the booklet are as follows: (1) General requirements. (2) Employee information and data to be contained in employers' records. (3) Length of time records shall be preserved. (4) Location and inspection of records. (5) Reports on records. (6) Granting of exceptions. (7) Revision of regulations. These regulations repeal and supersede all regulations previously issued on records to be kept by employers pursuant to Section 11(c) of the Fair Labor Standards Act.

Methods for Selecting Salesmen—Report No. 508—Published by The Dartnell Corp., Chicago, Ill. A report of the plans found best by 173 companies selecting salesmen. Actual experiences of companies using personality and aptitude tests to select salesmen. Includes exhibits of more than 50 application blanks, rating and interview forms now in use by companies. The 100-page report is 11½ by 9½ in. and has a leatherette loose-leaf binder. Price: $5.00.

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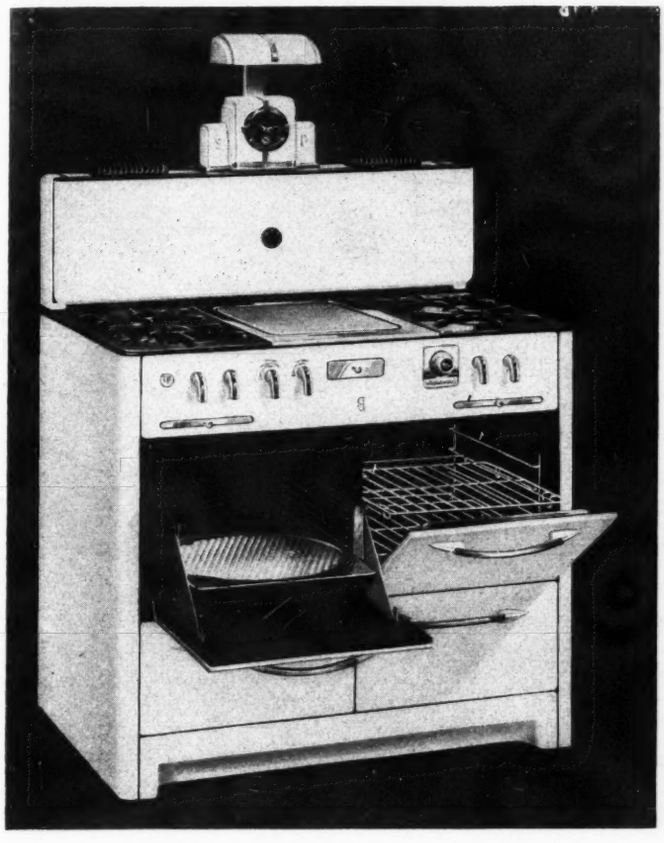

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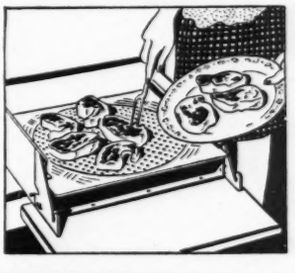

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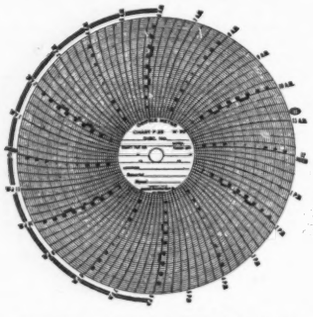

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MODERN *Products*

Gas Griddle

The Majestic Manufacturing Co., St. Louis, Mo.

Model: Majestic Kounter King Gas Griddle.

Description: Thermostatic control, single multi-tube burner, baffle plates over the flames, insulated sides, bottom and front produce a uniform cooking temperature over the entire griddle plate. Thermostat comes on full at a slight drop in surface temperature and prevents the slightest overheating. Griddle has a ⅞ in. high, square continuous welded rim to prevent spilling of grease over the edges. Griddle plate is ½ in. thick cast iron, machined flat, highly polished and heavily chrome plated. The over-all counter

depth of griddle, all sizes, is 19¾ in. deep, the height to the top of the rim is 9¼ in., the width varies with the size of the griddle plate required, but is only 2 in. more than the width of the griddle plate supplied.

■ ■

Rubber Flashlight

William M. Lennan, Inc., Pasadena, Calif.

Model: Rub-R-Lite.

Application: Shatter-proof, water-proof, flashlight for airlines, ships and manufacturers.

Description: A rubber flashlight in two and three-cell sizes in either focusing or fixed-focus types. Has a special two-button snap switch and an aluminum plated reflector with shatter-proof, plastic lens. Light is safe for working around electric wires and cannot be magnetized from tool boxes, engine rooms or ships where a surrounding of metals often magnetizes and wears out batteries whether used or not.

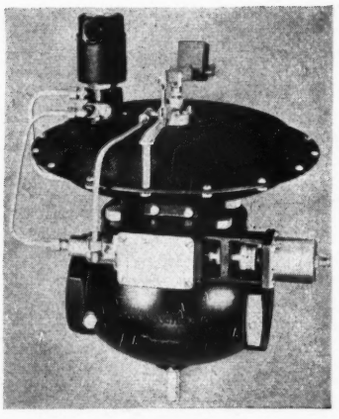
■ ■

Diaphragm Gas Valve

General Controls Co., Glendale, Calif.

Model: Series B-55G.

Description: This diaphragm operated fuel supply valve is electrically piloted and acts to maintain a constant steam pressure at all times by throttling the gas flow and air damper in direct proportion, yet eliminates the "hunting aspect" common to most throttling valves. Another feature of this gas valve is the low fire adjustment which sets the maximum amount of fuel supplied to the burner. The valve has a range of opening speeds adjustable from 20 to 60 seconds. Closing time is fixed, regardless of



opening adjustment, ranging from 3 to 6 seconds after electrical circuit is opened. Standard diaphragm sizes (free diameter) are 11 in. on the 1 in. to 1½ in. IPS valve sizes, 13 in. on the 2 in. to 3 in. IPS sizes, and 16 in. on the 4in. to 6 in. IPS valve sizes. The valve is available from 1 in. to 6 in. IPS. Gas pressure range: from 2½ in. water column to 5 lbs.; governors available for wide range of steam pressures. Full details may be secured by writing the manufacturer for engineering bulletin E-344.

■ ■

Air Driven Mixers

The Mixing Equipment Co., Rochester, N. Y.

Model: AR-25 and AR-33.

Application: Incorporate air driven motors.

Description: Propeller type mixers with turbine type air motors which are designed for agitator duty with built-in muffler for quiet operation and features a low rate of air consumption. The mixers are built for operation at air pressures of from 60 to 120 lbs. with the optimum operating range between 70 and 90 lbs. Other features include: a quick removable shaft for ease in cleaning, adjustable shaft length for various sizes of containers, a universal clamp permitting the mixer to be used at any angle in tank. The AR-25 operates at 1750 rpm. A 36-in. shaft with three inch propeller is standard. Weight is 26 lbs. The AR-33 operates at 400 rpm. and comes equipped with a standard 36-in. shaft. Propeller size is seven inches. Weight of the complete mixer is 29 lbs.

■ ■

Two-Speed Fan Control

Perfex Corp., Milwaukee, Wis.

Application: For forced warm air systems employing two-speed fans.

Description: Greater range of air delivery obtainable with two-speed fans produces minimum variation in temperature of air delivered to rooms and produces faster heating. The switching system is designed to start the fan on temperature rise and only on low speed, in order to protect the fan motor. The control can be set to switch the fan from low to high speeds at any

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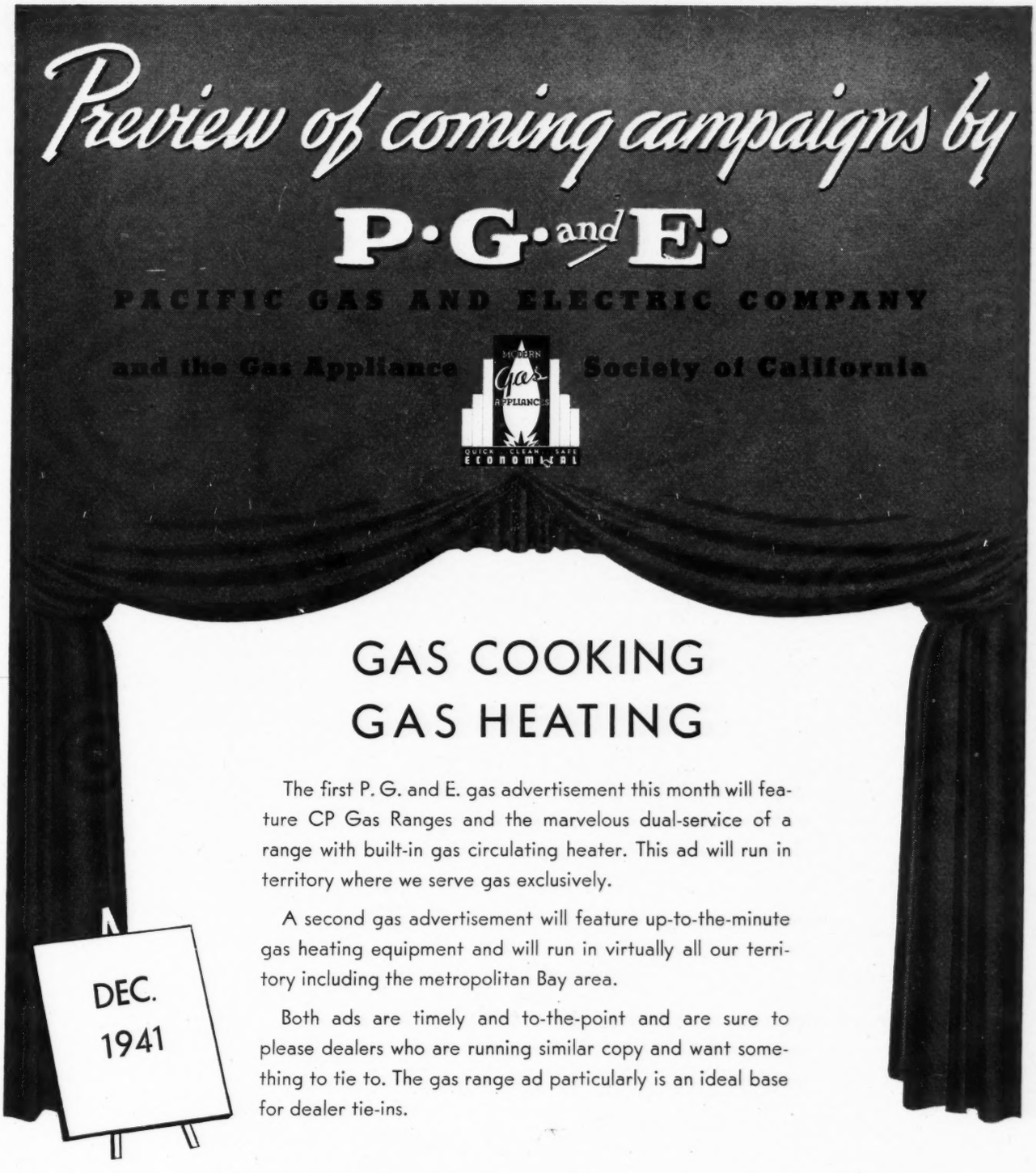

GAS COOKING
GAS HEATING

The first P. G. and E. gas advertisement this month will feature CP Gas Ranges and the marvelous dual-service of a range with built-in gas circulating heater. This ad will run in territory where we serve gas exclusively.

A second gas advertisement will feature up-to-the-minute gas heating equipment and will run in virtually all our territory including the metropolitan Bay area.

Both ads are timely and to-the-point and are sure to please dealers who are running similar copy and want something to tie to. The gas range ad particularly is an ideal base for dealer tie-ins.

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DEALERS: By watching this page from month to month you can keep informed of sales promotional campaigns to be sponsored by the Pacific Gas and Electric Company and the Gas Appliance Society. Detailed information will be supplied, as usual, through the mail. If such information is not received, call our local office or write Gas Appliance Society, 1355 Market Street, San Francisco, California

desired bonnet temperature. All cut-in and cut-out settings are made independently. Bonnet temperature is indicated on an external scale. Turning the external knob to the "summer cooling" position produces continuous high speed fan operation without disturbing temperature settings.

■ ■

Horizontal Thermostats

Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Models: TA42A and TA42B.

Application: For heating and for heating and/or cooling.

Description: Designed for use where accurate and dependable control of line voltage, heavy duty devices are involved and are capable of handling directly large motor driven units, cold blowers, cooling equipment, industrial and commercial stoker fired heating plants, etc. On larger or polyphase motors they should be used in connection with magnetic starters. They can be used in low voltage circuits. The horizontal design provides maximum air circulation and greatly reduces the effect of contact heat. This is a non-magnetic switch, self enclosed to protect it from dirt, dust, moisture and grime, and has been proved by exhaustive tests to be capable of years of dependable service. Another distinctive feature is the temperature setting knob which can be removed to lock the thermostat in order to prevent unauthorized tampering. Models are also available with a "positive on" feature for cooling applications.

■ ■

Tube Pressure Gauge

The Brown Instrument Co., Philadelphia, Pa.

Model: Rectangular Case Bourdon Tube Pressure Gauge.

Description: Strongly constructed, this new gauge possesses greater accuracy, and has a patented "recalibrator" which provides a means for easily and accurately setting the pen on zero. In addition to the "recalibrator" there is a micrometer zero adjustment on the pen arm itself. The methods of construction used in the new gauges. consisting of a one piece casting supporting the bourdon tube, the gear and pinion, and the pen arm shaft, makes it possible to have the whole assembly installed in the case as one completely calibrated unit. This construction simplifies the replacement problem. The "lock-tite" method of sealing the ends of the stainless steel tubes which are used in the gauge for certain pressure ranges is an important feature. With this method of sealing, the heat-treatment and original calibration of the tube cannot be affected, as might be if the tubes were closed by welding.

Catalogs

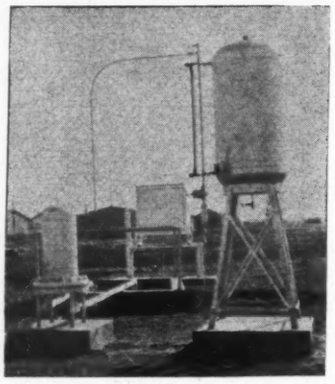
• The Bastian-Blessing Co., Chicago, Ill., is offering to the liquefied petroleum gas industry a convenient reference manual in the form of the "Rego LP-Gas Pocket Guide." The Guide contains basic data, charts, tables and other information relevant to the industry. It coordinates technical and specialized knowledge in connection with the merchandising and handling of liquefied petroleum gases and is prepared primarily to help the dealers' salesmen and servicemen to a better understanding of the product they sell. Pocket Guide sheets, 6¾ x 3¾ in., are inserted in a leatherette six-ring looseleaf binder. The binder, complete with all pages published to date, may be secured for 50¢, prepaid, by writing The Bastian-Blessing Co. Supplementary looseleaf pages will be mailed from time to time to all binder holders without additional charge for as long as the present publishing procedure is used.

• Compressed Air Institute, New York, N. Y., issued the fifth edition of its Trade Standards in September, 1938. This publication contains a wealth of technical information concerning rotary compressors and vacuum pumps, centrifugal compressors and blowers, compressor accessories, rock drills and pneumatic tools, reciprocating compressors, etc.; all of which assumes major importance in the National Defense Program. Price of the publication is $1.00 plus postage.

• The Cleveland Worm & Gear Co., Cleveland, Ohio, has issued an eight-page booklet titled, "Background," which contains a series of letters from manufacturers in various leading industries who have used Cleveland drives 15 or 20 years. The reports describe graphically the conditions under which worm gear drives must operate in each particular industry. Booklet may be obtained by addressing The Cleveland Worm & Gear Co.

• Stephens-Adamson Mfg. Co., Aurora, Ill., in a recent issue (Vol. 188) of The Labor Saver magazine, have offered the latest available information on new material handling designs and solutions to problems which are confronted along this line. The magazine is published for users and engineers of conveying, elevating, screening and transmission equipment and has a circulation of 30,000.

• The Bristol Co., Waterbury, Conn., has just published a bulletin containing a condensed index of the products they manufacture and of their engineering services. The bulletin covers air-operated and electrically operated automatic control instruments, recording and indicating instruments, and telemetering instruments for recording and remote automatic control. A copy of this bulletin (No. 585) may be obtained upon request.



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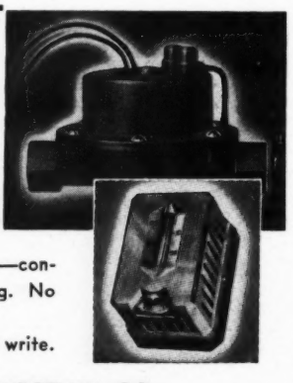

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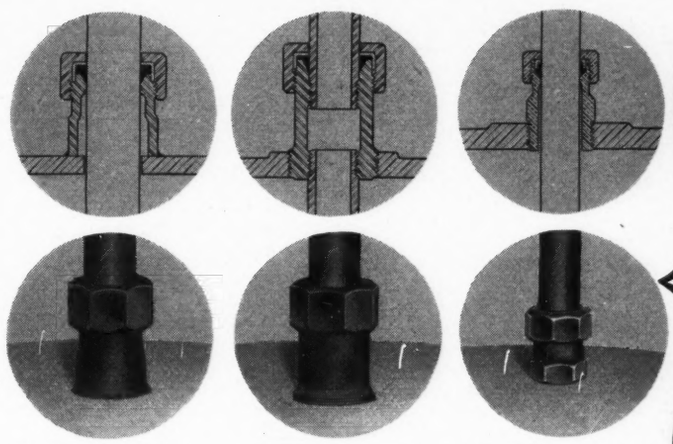
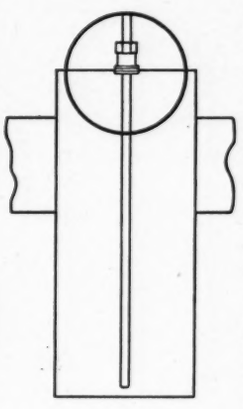


Method No. 1—One half of Style 90 Regular Coupling body welded to top of steel drip-pot. Riser pipe passes through Fitting and is sealed by tightening follower-nut.

Method No. 2—Style 90 Special Drip Adapter for steel riser. Threaded and screws into top of drip. Sections of riser pipe are joined by simple screw connection.

Method No. 3—Style 88 Male Adapter for copper tube riser. Threaded end of Fitting screws into top of drip, while other end is sealed by tightening follower-nut.



Connecting the riser pipe through which condensate is pumped from drips in distribution lines is a "nuisance" to most gas-operating men. At left are illustrated three different methods of making drip-pot connections with Dresser Special Fittings. Each method provides a strong, simple, permanently tight connection. Save time and bother by standardizing on Dresser Special Fittings for all your drip-pot connection work. Write for complete details.

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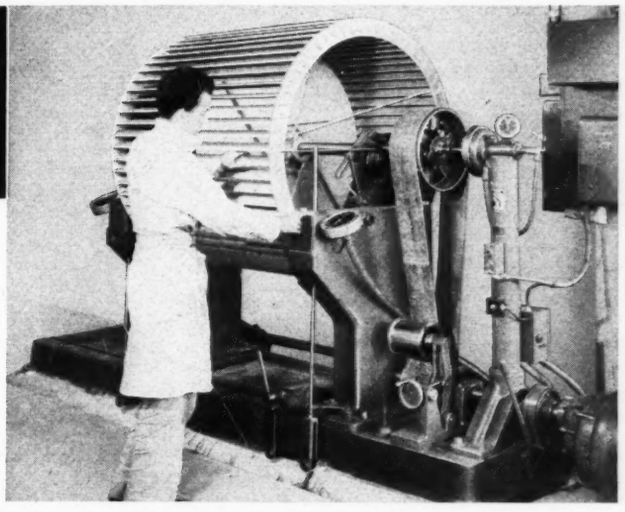

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Association Abstracts

ON THESE PAGES are published abstracts of papers presented before recent meetings of the gas industry's associational groups. These abstracts are published to save the reader's time, to furnish him with capsule information on contributions to gas association programs. The publishers of GAS will gladly forward requests for further information to authors of papers abstracted in this department.

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• ABSTRACTS of papers presented at the Industrial and Commercial Sessions at the American Gas Association's 23rd Annual Convention, Atlantic City, N. J., October 20-22, 1941.

Increasing Your Heating Business in Commercial Establishments—Charles F. Spicer, vice president and general sales manager, The Moore Corp., Joliet, Ill. Gas companies that are not intensively working to put the maximum quantity of commercial heating on their lines are overlooking a profitable bet. Gas heating equipment is available that has been scientifically designed for each type of application necessary for each individual commercial requirement; all better built, more attractive and giving better performance than in the past, and at a lower operating cost. Accurate market analyses and surveys should be made but such activities will not produce business unless followed by good direct mail pieces, and well posted, well trained sales people and engineers. Campaigns, however, do not replace regular sales work and regular promotion. Closing thought: "We must keep on telling, if we expect to keep on selling."

Increasing Your Heating Business in Commercial Establishments—Elroy L. Payne, vice president and general manager, Payne Furnace & Supply Co., Beverly Hills, Calif. No public acceptance of gas as a heating medium unless four points are clearly established. These four points are: (1) Properly *selling* each job. (2) Correctly *sizing* each job. (3) Properly *installing* each job. (4) Properly *servicing* each job. Almost every commercial gas heating installation presents its own engineering problems and its own opportunity to exercise judgment. A series of installation drawings were presented with particular attention given to venting.

Opportunities I See For Selling Commercial Gas—O. F. Keune, gas sales manager, Florida Power & Light Co., Miami, Fla. Opportunities for selling commercial gas must be created—created through market research and *planned* sales programs. The reason commercial sales planning is of particular importance is that commercial customers are in the middle, between residential and industrial customers. A formula is necessary in preparing the sales program. Ten basic principles are as follows: (1) Base revenue objectives on needed revenue. (2) Prepare a written sales program. (3) Select the most needed service for emphasis. (4) Use ample advertising and sales promotion. (5) Secure all possible publicity from newspapers, exhibits, etc. (6) Train the sales organization continuously. (7) Contact all prospects with the sales story two or three times each year. (8) Plan sales calls carefully. (9) Secure active support of manufacturers and food service industry. Point out their opportunity to profit. (10) Keep adequate records and close control.

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• ABSTRACTS of papers presented before the Pacific Coast Gas Association's 48th Annual Convention, Del Monte, Calif., Sept. 10-12.

Accelerated Student Training—R. C. Terradell, Southern California Gas Co., Los Angeles, Calif. The trend of the Customer Service Student Training phase of the Southern California Gas Co.'s distribution department training program has been toward shortening the period of training in preparation for the following job classifications:

1. Serviceman No. 2, whose duties include turn-ons, closes (turn-offs), routine meter changes, and in connection with this work, minor appliance adjustments and leakage repairs where necessary.

2. Serviceman No. 1, whose assignments chiefly involve the following domestic service: The adjustment of any gas appliance; parts replacement on any appliance; leakage, high bill and any other special investigations, in addition to the duties outlined as part of the Serviceman No. 2 assignment.

3. Industrial serviceman, who essentially renders inspection, adjustment, and advisory service to all industrial and commercial customers.

The time required to administer the training was established by student appraisals, which included routine reviews of classroom material; supervisory appraisals both during training and during one day's observation of the work executed by the student at the conclusion of training.

An appendix outlines the material covered in the three courses.

The Gas Engine—Heat Distribution and Dissipation—John Rogers, Pacific Coast Manager, Cooper-Bessemer Corp., 640 E. 61st street, Los Angeles, Calif. Presents the fundamentals of heat distribution and dissipation as applied to the modern gas engine operating in the higher temperature plane. The author discusses the advantages of higher temperature operation as compared with the disadvantages of cooler temperature operation, the economic advantage of higher temperature operation, and the methods of piston cooling and heat dissipation employed in present day gas engines.

Use of Millivolt Meter for Testing Thermocouple Type Safety Pilots—E. T. Howard, General Controls, 801 Allen Ave., Glendale, Calif. The widespread and growing use of thermocouple type safety pilots makes it desirable that their installation and testing be thoroughly understood. This paper includes all the information necessary to the serviceman.

Service Practices of Pacific Coast Companies—A. C. Renz, assistant superintendent of distribution, Southern California Gas Co., Los Angeles, Calif.

House Heating Research—Guy Corfield, Southern California Gas Co., Los Angeles, Calif. Inasmuch as the published criteria for gas heating calculations, designs, and installations are not considered applicable to the climate and other conditions in the Southern California area, the Southern California and the Southern Counties Gas companies have jointly constructed a heating research house.

This paper describes the type of data sought, the details of the house itself, and the equipment and instrumehts used for the test work.

■ ■

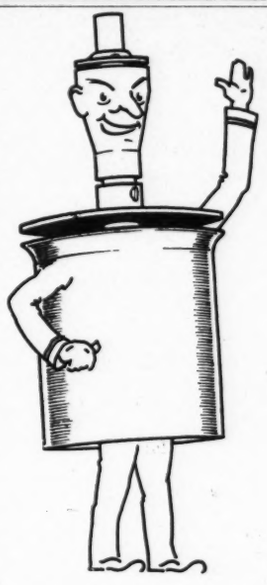
• ABSTRACTS which are listed below are of papers presented at various associational meetings throughout the year 1941. Further information regarding the subjects covered may be obtained by addressing requests to GAS.

Compressor Losses Caused by Orifice Meters—J. G. Bevenham and V. E. Middlebrook, Shell Oil Co., Inc. The net effect of an orifice is to produce a final downstream pressure which is lower than the upstream pressure; *i.e.*, a loss in pressure. This will result in decreased volumetric efficiency or increased horsepower requirements at a compressor station, of sufficient magnitude to justify careful study toward elimination of unnecessary meters or at least reduction in differential pressure. Frequently gas volumes can be deduced from related operations or performance in a plant; often meters measuring relatively constant flows could have larger discs; sometimes meters will be found that can be more economically sized, or may even have outlived their usefulness at their particular location because of changes in plant operation. Charts and tabular data are included, evaluating pressure losses under typical conditions.—Natural Gasoline Association of America, Annual Convention, Dallas, Texas, April, 1941.

Making Gas Measurement in a Cycling Plant—D. A. Sillers, Lone Star Gas Co., Dallas, Texas. Handling of high pressure gas introduces a number of special problems, both in field and office, concerned with the checking of plant gas measurement. These problems were met to obtain a check on gas flow to within one per cent. Meter installation and office problems are described in detail. A simplified method is outlined for applying the method and formula of Dr. G. G. Brown, University of Michigan, for solving high pressure gas flow and plant problems. —Natural Gasoline Association of America, Annual Convention, Dallas, Texas, April, 1941.

Simplified Estimates of Gas Engine Power Requirements and Costs—E. A. Bartolina, Consolidated Gas Utilities Corp., Blackwell, Okla. The selection of the right unit to do the job satisfactorily is the most important item in gas engine power promotion. The paper furnishes data on power analyses and ratings, selection of right power unit, and cost of operation broken down into B.t.u. per brake horsepower-hour, lubricating oil, repairs and maintenance, labor and fixed charges. Several example computations are presented.—Oklahoma Utilities Association, Tulsa, Okla., March, 1941.

Telemetering and Remote Control—Publication No. 9, August, 1940—H. J. Keeling, Southern Counties Gas Co. of Calif., Los Angeles, Calif. A telemetering system may be as simple or complex as the application demands. The basic idea is to: first, convert the information at the remote point into the mechanical motion of an indicating needle or mechanism; second, translate this mechanical motion into electrical currents or impulses capable of being transmitted over wires to the receiving instrument; and third, at the receiver retranslate these impulses back into the mechanical motion of an indicating needle or recording pen calibrated in the original units. The A.I.E.E. has grouped all telemetering systems into the five classifications: current, frequency, impulse, posi-



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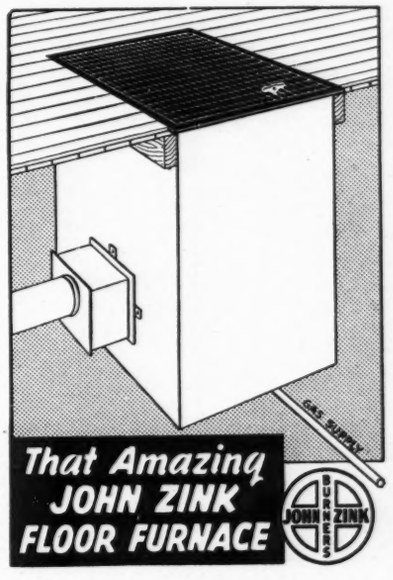

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tion, voltage. It is only a step from telemetering to remote control, the same principles being used except that the transmitting unit is operated manually by an operator or automatically by suitable equipment. Descriptions are given of typical usages and installations. — Southern California Meter Association.

Gas Flow Computations—P. McDonald Biddison, consulting engineer, Dallas, Texas. The purpose of this paper is to develop the methods of solution of gas flow problems in a manner enabling the use in current practice of information in friction factor that has become available since the publication of Monograph 6 of the U.S. Bureau of Mines (Flow of Natural Gas Through High-Pressure Transmission Lines), and in addition to bring to the attention of the natural gas industry the desirability of the accumulation of additional data acquired under conditions where a reasonable degree of accuracy is obtainable.—A.G.A. Natural Gas Section Convention, Dallas, Texas, May, 1941.

Effect of Compressibility Factor on Horse-Power Requirements in High Compression (above 1000 lbs. per sq. in.)—C. L. Moore, El Paso Natural Gas Co., El Paso, Texas. Consists of data and conclusions, from study of compressibility effects in high compression of natural gases, as assembled from the various engine builders and independent sources. The effects are discussed as they relate to (a) horsepower requirements and (b) compressor performance.—A.G.A. Natural Gas Section Convention, Dallas, Texas, May, 1941.

Cathodic Protection as a Possible Means for Preventing Corrosion of Gas Well Casing—Wm. E. Huddleston, corrosion engineer, Cities Service Gas Co., Bartlesville, Okla. With certain limitations, cathodic protection may provide an economical means of combating corrosion on gas well casing. Criteria differ somewhat from those commonly used for protection of pipe lines, particularly as regards anode design and power load requirements for a given length of casing. The useful life of well casing can, in general, be doubled if it is insulated from the field gathering lines.—A.G.A. Natural Gas Section Convention, Dallas, Texas, May, 1941.

Welded Pipe Headers and Their Reinforcement—E. R. Seabloom, Supervising Engineer, Research and Development Laboratories, Crane Co., 4100 So. Kedzie Ave., Chicago, Ill. In many welded piping installations, fabricated branch connections, headers and manifolds are also employed, but these are subject to higher stresses than line joints, especially if they are constructed from pipe of the same wall thickness as the straight lengths. This is particularly true of nozzles of the same size as the header, and also with nozzles approaching the size of the header. The pressure to cause yielding, as well as the ultimate strength of the branch assembly or manifold, is considerably lower than with straight lengths of pipe without any openings. Considerable detailed and illustrated data, from a series of tests conducted by Crane Co., are presented in this connection. Various methods of reinforcement are described and evaluated. A preliminary outline of the new revised A.S.A. Code for Pressure Piping, covering all piping used at pressures above 15 p.s.i., is given.—A.G.A. Natural Gas Section Convention, Dallas, Texas, May, 1941.

Charts for Calculating Flue Loss from Industrial Gas Furnaces Using Special Atmospheres—Dr. F. E. Vandaveer and C. R. Cline, A.G.A. Testing Laboratories, Cleveland, Ohio. A series of studies conducted at the A.G.A. Testing Laboratories to establish basic combustion relationships for gas burned with a deficiency of air, have added to the industry's knowledge of gas combustion fundamentals. The data have been useful in construction of the flue loss charts presented. These charts are divided into three groups: products of combustion untreated; products of combustion treated for removal of water vapor and carbon dioxide; when using other special types of furnace atmospheres.—A.G.A. Industrial and Commercial Gas Section Conference, Baltimore, Md., March, 1941.

Application of Gas to New Type Air Conditioned Smoke Houses — J. Paul Jones, Consolidated Gas, Electric Light & Power Co. of Baltimore. The development of the "Air Conditioned Smokehouse," using steam as a heat source threatened to deprive the gas industry of the smokehouse load. Consequently, a direct gas-fired air conditioned unit was developed, with recirculated hot air, smoke producer, temperature and humidity control, ventilating fan, and protective controls. Operation is economical and product uniform. Complete details are provided.—A.G.A. Industrial and Commercial Gas Section Conference, Baltimore, Md., March, 1941.

Newly Developed Technical Information of Valve on Applying Industrial Gas—W. R. Teller, A.G.A. Testing Laboratories, Cleveland, Ohio. A review of current gas combustion research including composition of flue gases resulting from combustion of gas with a deficiency of air, calculation of flue losses from industrial gas furnace using special atmospheres, and design of atmospheric gas burners.—A.G.A. Industrial and Commercial Gas Section Conference, Baltimore, Md., March, 1941.

Durability and Progress on Chimney Lining—N. J. Ide, Wisconsin Southern Gas Co., Burlington, and William Little, Wisconsin Gas and Electric Co., Racine. Discusses materials and installation methods for lining of chimneys for venting of gas burning appliances. Included among the materials are copper, transite, vitreous enamel and glazed sewer tile.—Gas Section Convention of Wisconsin Utilities Association, Milwaukee, Wis., March, 1941.

Insurance for Gas Companies—Clarence T. Hubbard, secretary, Automobile Insurance Co. of Hartford, Conn. There are at least 200 different forms of insurance which a gas company can purchase. The most important of these are briefly described. A company can obtain the most effective insurance protection through the "insurance survey" made by carefully selected agents or brokers, so as to (a) centralize insurance responsibility for analysis and supervision in one common source (even if individual policies have to be distributed among several agents or brokers) and (b) review all insurance contracts, financial and credit problems, and safety measures at definitely stated periods with a chosen insurance representative. — New England Gas Association Annual Business Conference, Boston, Mass., March, 1940.

When to Remove Idle Gas Meters—G. E. Woods, Jr., and G. E. Garnhart, Consolidated Edison Co. of New York. To determine when, if ever, locked gas meters in temporarily vacant residential premises should be removed and returned to active service for maximum economy of meter operation. A solution is presented on the basis of current experience with residential vacancies in New York City, using the company's present unit investment and operating costs for gas meters. On this basis, there appears to

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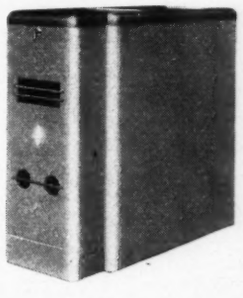

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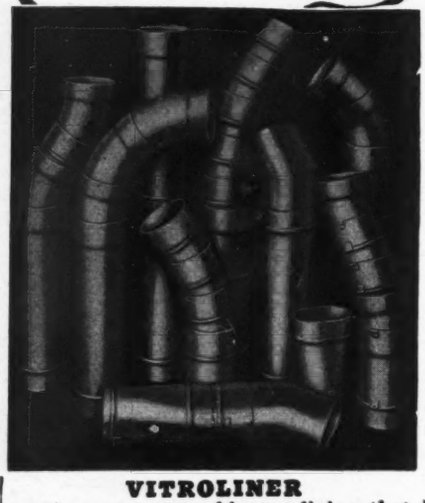

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be no economic justification for removal of the meter unless there be definite prospects of the premises remaining vacant for at least 17 months after removal. The method of solution has been formulated to facilitate application in other situations involving different probable vacancy durations and unit costs.—A.G.A. Distribution Conference, Pittsburgh, Pa., April, 1941.

Shop Methods for Improving Gasoline Economy — Errol J. Gay, Ethyl Gasoline Corp., Detroit, Mich. In all vehicles, regardless of service, the largest single item of operating costs is the money paid for fuel. Usually this is somewhere near 25% of total operating cost. The carburetor spends this money. General maintenance of the vehicle, and selection of the fuel used, should precede or at least accompany carburetor adjustment, care and inspection.—A.G.A. First Annual Conference on Operation of Public Utility Motor Vehicles, Pittsburgh, Pa., April, 1941.

• ABSTRACTS of Gas Utilization Bulletins, issued by Pacific Coast Gas Association, 447 Sutter Street, San Francisco, Calif.

Lithograph Plate Drying Oven—Bulletin No. 93—Fred J. Mahr, Pacific Gas and Electric Co., San Francisco, Calif. A sheet metal cabinet has a capacity of 24 x 20 x 30 in. lithograph plates. A gas-fired warm air furnace installed nearby delivers warm air into the top of the cabinet through the warm air duct and draws air from the bottom of the cabinet through the return air duct, thus creating a downward circulation in the cabinet. Frequent opening of the doors permits fresh air to replace saturated air. No insulation is necessary as the drying takes place at only 120° F.

An Emergency Torch for Pipe Bending—Bulletin No. 94—C. C. McRae, Pacific Gas and Electric Co., San Diego, Calif. This torch is made of 3-in. pipe and Standard pipe fittings and consists essentially of air and gas supply connections, mixing chamber and flame retention and flame shaping nozzle. It burns 500 to 600 cu. ft. per hour of natural gas at 1-lb. pressure and requires approximately 100 cu. ft. of air per minute, which air is supplied by a centrifugal blower powered by a ⅛ hp. motor. All types of bends have been made on pipe from 4 to 14 in. diameter.

Oven for Baking Synthetic Coating—Bulletin No. 95—Chas. A. Carlson, Pacific Gas and Electric So., San Francisco, Calif. The oven has 9-in. red brick walls, and ceiling of sheet iron with puffed rock insulation. It is 23 ft. long, 10 ft. wide and 8½ ft. high. It has a 6-in. vent at each end and a circulating fan in the center of the ceiling. Heating equipment is a 20-ft. long burner manifold at the bottom of each side. Each manifold carrying five sets of Acme Venturi tile gas burners spaced about 3-ft. centers, and controlled by a Minneapolis-Honeywell Brown K-900A modulating motorized valve.

Pipe Dipping Tank Immersion Tube Fired—Bulletin No. 96—Otto Ketelsen, Sr., San Diego Gas and Electric Co., San Diego, Calif. A tank for applying hot asphaltic coating to pipe by dipping, originally designed for underfiring with wood, was converted to gas by installing two immersion tubes of 6-in. pipe, two inches from the bottom. The tank is 23 ft. long. Gas is supplied at 5 lbs. pressure. Tubes are fired from opposite ends, and temperatures are very uniform throughout the length of the tank.

Dy-Dee Service Laundry for the Baby—Bulletin No. 97—Ray Trowbridge, Seattle Gas Co., Seattle, Wash. A baby clothes laundry service selected gas fuel because of its adaptability, cleanliness, safety and ease of control. Hot water at 190° to 200° F. is supplied by three automatic water heaters; the clothes are dried in four gas heated driers which tumble the clothes in circulating warm air in rotating baskets. Gas usage is 152 M c.f. per month of 550 B.t.u. gas.

A Low Temperature Enamel Oven—Bulletin No. 98—Ray Trowbridge, Seattle Gas Co., Seattle, Wash. A low temperature bake enamel oven was built for finishing of fender and other repairs to automobiles. It is 9 ft. high, 9 ft. wide and 24 ft. long. The automobile is moved from the enamel spray room into the oven, where it is baked at temperatures from 160° to 180° F. for one hour. The oven is constructed in "knock-down" form so as to be semi-portable.

An Oven for Processing Honey—Bulletin No. 99—Ray Trowbridge, Seattle Gas Co., Seattle, Wash. Honey is received from the bee farm in five gallons and must be heated for several hours at a temperature not exceeding 125° F. Gas was selected as fuel because of rapid heating and ease and accuracy of control. The described oven has a capacity of four five-gallon cans. It cost $90.00 installed and operates on 500 B.t.u. gas at ¾ of a cent per pound of honey.

Mirror Manufacture—Bulletin No. 100—Ray Trowbridge, Seattle Gas Co., Seattle, Wash. In mirror manufacture speed is essential in drying the glass prior to silvering, and in drying the paint coat that protects the mirror back. Drying racks and table are heated with warm air from a rotor type unit heater installed in the basement.

Large Capacity, Light Weight Natural Gas Torches — Bulletin No. 101 — M. A. Richford, Pacific Gas and Electric Co., San Francisco, Calif. Such torches are very useful in shipyards and other heavy steel fabricating plants, for preheating, binding, etc. They are made of thin wall steel tubing and standard pipe fittings. The largest one described weighs 14 lbs. and consumes 3000 cu. ft. per hour of natural gas at pressure of 20 p.s.i.

Use of Gas by Military Camps—Bulletin No. 102—J. H. Gumz, Pacific Gas and Electric Co., San Francisco, Calif. Experience at army encampments to date shows that the use per man per year, in terms of 1130 B.t.u. natural gas is as follows: cooking, 4230 cu. ft.; water heating, 5370 cu. ft.; heating, 14,000 cu. ft.; cooking use includes kitchen hot water and heating use includes heating of recreation halls for a 3000° day season. The maximum hourly demand, during heating season, is 11 to 13 cu. ft. per man, equivalent to about 55% to 60% of the load.

Furnace Metal Melting—Bulletin No. 103—Fred C. Dietrick, Pacific Gas and Electric Co., San Francisco, Calif. Old fashioned crucibles for melting brass, bronze and aluminum are customarily fired by coke and are slow, expensive and difficult to control. Conditions in a foundry are greatly improved in all respects if they are replaced by gas-designed crucible furnaces as described.

Conversion of Continuous Hoffman Kiln—Bulletin No. 104—J. J. Toolan, Pacific Gas and Electric Co., San Francisco, Calif. The use of gas, instead of powdered coal, as fuel for Hoffman continuous fired type brick and tile kilns, gives decidedly cleaner and more uniform results.

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An Important Message To Furnace Dealers

The constantly increasing demand for Fraser Furnaces, combined with raw material restrictions, are almost sure to slow down deliveries sometime next spring.

The speeding-up of many shipments can be materially aided if the monthly production of each unit can be matched to monthly needs.

Without committing you, it will be very helpful if you will give us some idea of your expected requirements for each of the first six months of 1942.

This cooperation will aid you and us to give better service and avoid customer disappointments.

Every effort will be exerted to ship orders promptly but, in fairness to all, they must follow the sequence of receipt.

"It's the Inside of the Furnace That Counts"

FRASER QUALITY MAKES CUSTOMER SATISFACTION

FRASER

H. R. BASFORD CO. DISTRIBUTORS SAN FRANCISCO - LOS ANGELES

GAS HEATING EQUIPMENT

FRASER FURNACE CO. MANUFACTURERS STOCKTON CALIFORNIA

WALK IN SAFETY

over nails, spikes, jagged metals

Lost time injuries due to foot puncture wounds are banished along with costly compensation claims, with Bullard Protective Insoles. Two layers of a new rugged flexible plastic give positive protection. Glove-fitting woven cover gives cushion-comfort inside boots or shoes. Non-absorbent and completely flexible; weighs but 2 oz. Sizes 6-11.

NEW FOOT COMFORT

New materials of flexible plastic, with woven "cushion" cover adds comfort to protection.

Ask for prices and descriptive leaflet. ☆ E. D. BULLARD Co., 275 Eighth St., San Francisco, Calif. B-9

Protection with comfort! So flexible, the sole can be rolled in a circle! Weight, 2 oz.!

Everything BULLARD in Safety

BULLARD *Protective* INSOLES

Laboratories Adopt Revised Fees For Directory Listings

AT a recent meeting of the Laboratories Managing Committee a new schedule of fees for listing certified equipment in the Directory of Approved Gas Appliances and Listed Accessories was adopted to become effective January 1, 1942.

In view of the increasing number of manufacturers whose listings exceed 100 lines in the Directory, and since the majority of such listings consisted of models approved by extension, it was felt a reduction in listing charges was indicated in such cases. The following were established: $1.50 per line for first 100 lines; $1.00 per line for second 100 lines; 50¢ per line for all over 200 lines.

A second revision adopted covers listing fees for only a fraction of a year. Since major costs of type setting and paper remain constant regardless of the issue of the Directory involved, flat rates for each quarterly period were adopted as more in line with actual publication costs.

■ ■

New Gas Fields Are Drilled In California Buttes Fields

To meet the demand for more natural gas, Buttes Oilfields, Inc., of Oakland, Calif., is engaged in drilling five new wells in the Buttes gas field 12 miles west of Marysville, Calif. Buttes number seven was drilling ahead rapidly at 2267 ft., a mile and a half west of the four producers that have supplied the central Sacramento Valley with natural gas since 1938. Almost rigged and ready to spud is number eight which, along with four others, was located by a field survey last year.

Significant to the new development is a statement from the Pacific Gas and Electric Co. that the service area of the Buttes field will be widened with the completion of the wells. Plans for a 40,000 man Army cantonment in the district, requiring gas fuels in large volume, has been announced by the government.

■ ■

Vinson Supply Co. Opens Two New Stores in Texas

Two branch offices of the Vinson Supply Co., Tulsa, Okla., have recently been opened in Texas. The Texas Panhandle territory will be served by the newly formed office in the Rule Building, Amarillo, Texas, in charge of W. Dow Perry.

The company has also opened a new store at Odessa, Texas, which will warehouse Fisher Control Equipment for that area. Louis Barnett will be in charge of the store. Robert Searls is warehouseman in control of stocks and shipments.

The addition of these two branches brings to four the number of offices maintained by the company in Oklahoma and Texas. The other two offices are in Tulsa and Dallas.

GEORGE A. BURRELL

Gas Engineer

Design—Construction—Reports
Court Work

■

Suite 1909
20 Pine St.
New York City

1936-42 5th Ave.
Pittsburgh, Pa.

■ ■

Permit Sought to Repressure Cayuga Field in Texas

Application of Amerada Petroleum Corp. for authority to take gas from the Glen Rose formation in the Cayuga field, Anderson and Freestone counties, Texas, strip the distillate and return the lean gas to the Bowyer sand is pending before the Texas Railroad Commission.

The application is opposed by Roger Steward, representing J. L. Collins & Co., owner of the adjacent lease, who told the commission that his company's wells are already making so much gas that it is difficult to produce the allowable. He blamed the high productivity of gas on the other repressuring operations in the field.

■ ■

Natural Gas Service Co. Adds Arizona Towns to System

The Natural Gas Service Co., of Coolidge, Ariz., is now constructing and installing services at Clifton and Morenci, Ariz., which towns have been added to the company's system, according to E. F. Kellner, general manager. H. Cecil McCullar is branch manager in the two towns. Natural Gas Service Co. purchases its gas from El Paso Natural Gas Co., which owns and operates main lines throughout Arizona.

The company serves, also, the Arizona towns of Casa Grande, Coolidge, Florence, and Superior.

■ ■

Coast Counties Co. Cuts Gas Rates $192,000 Annually

The rates of Coast Counties Gas & Electric Co., Santa Cruz, Calif., for natural gas and electricity will be reduced $280,000 annually, Commissioner Richard Sachse of the California Railroad Commission has announced.

The reduction, which follows the conclusion of an investigation of the company's operations during the last year by the staff of the Commission, means natural gas charges will be lowered $192,000 and electric rates by $88,000 on an annual basis.

■ ■

FPC Approves Rate Cut By Washington Gas Light Co.

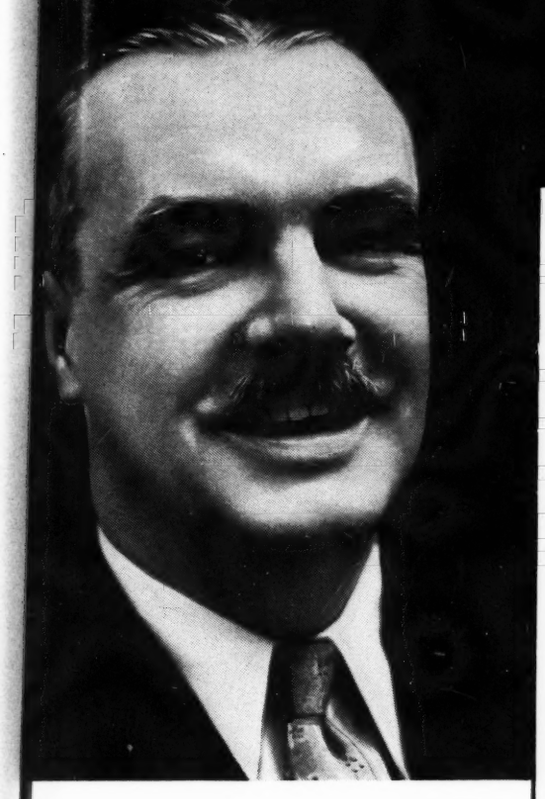
The Federal Power Commission has approved a 9.8% reduction in the rate for gas sold by the Washington Gas Light Co., Washington, D. C., to its affiliate, the Alexandria Gas Co., Alexandria, Va. The rate reduction is estimated at $14,065 annually in the wholesale rate of Washington to Alexandria.

■ ■

Southern Production Co. Has Completed 125-Mile Line

Southern Production Co., subsidiary of the Southern Natural Gas Co., Birmingham, Ala., has completed its 125 miles of 14-in. pipe line from the Joaquin-Logansport gas field of northeastern Shelby county, Texas, and northwest DeSoto parish, north Louisiana, to the Monroe field and thence into the Birmingham trunk line.

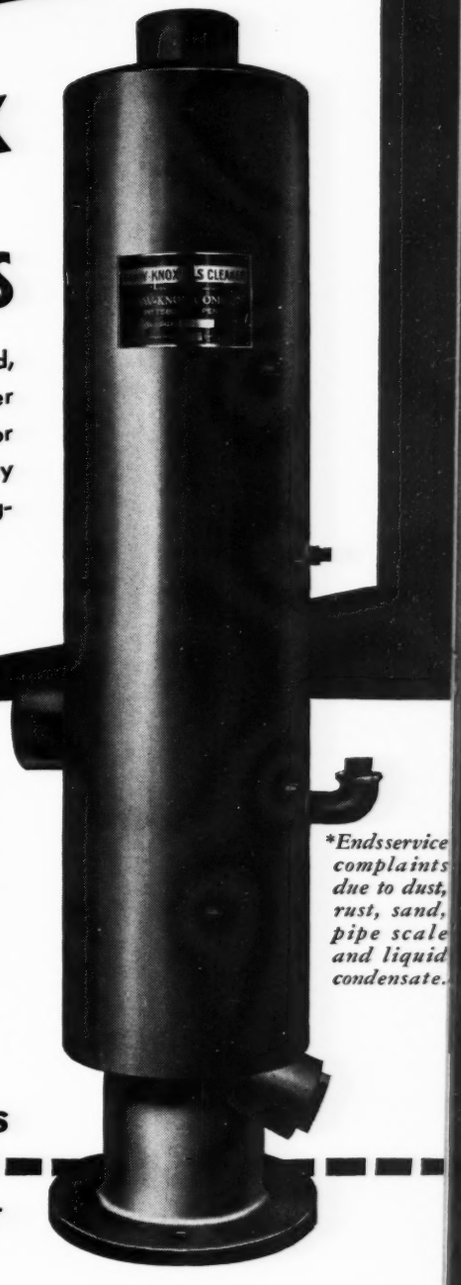
INVEST 2c PER CUSTOMER AND *End* SERVICE COMPLAINTS*



The new

BLAW-KNOX "K" series GAS CONDITIONERS

are ready to serve you. The "K"-6L, illustrated, will condition 396,000 standard cubic feet per day flowing at 30# gage pressure. It is ideal for medium and large industrial service; small city gate stations; town border stations; district regulators. It costs only **$95.00**



THINK of the advantage of getting a final clean-up, a final conditioning, of the gas just in front of a good customer's meter. Or of an entire district, or one of your town border stations. Let Blaw-Knox "K" series Gas Conditioners exactly fill your requirements. They are available from stock in two sizes and three weights for service up to 800# gas pressure. Easy to install, inexpensive, a sure way to insure delivery of CLEAN, CONDITIONED GAS. Fill in and mail the coupon, today, and we'll send full information as to type of unit required, how installed and cost. Blaw-Knox Division of Blaw-Knox Company, Pittsburgh.

**Ends service complaints due to dust, rust, sand, pipe scale and liquid condensate.*

CLEAN GAS MAKES SATISFIED CUSTOMERS

MAIL COUPON TODAY

BLAW-KNOX DIVISION OF BLAW-KNOX COMPANY
Farmers Bank Building, Pittsburgh, Pa.

Gentlemen:

Without obligation I would like to have more information on your "K" series Gas Conditioning Equipment. My conditions are as follows:

District Regulating Station	☐ Max. Gas Volume MCF hour . . .	Min. Pressure_____	Max. Pressure_____
Small City Gate Station	☐ Max. Gas Volume MCF hour . . .	Min. Pressure_____	Max. Pressure_____
Town Border Station	☐ Max. Gas Volume MCF hour . . .	Min. Pressure_____	Max. Pressure_____
Industrial Take-off	☐ Max. Gas Volume MCF hour . . .	Min. Pressure_____	Max. Pressure_____

Principal material to be removed . . . Dust ☐ Rust ☐ Sand ☐ Scale ☐ Liquid Condensate ☐

*Name*_____ *Title*_____

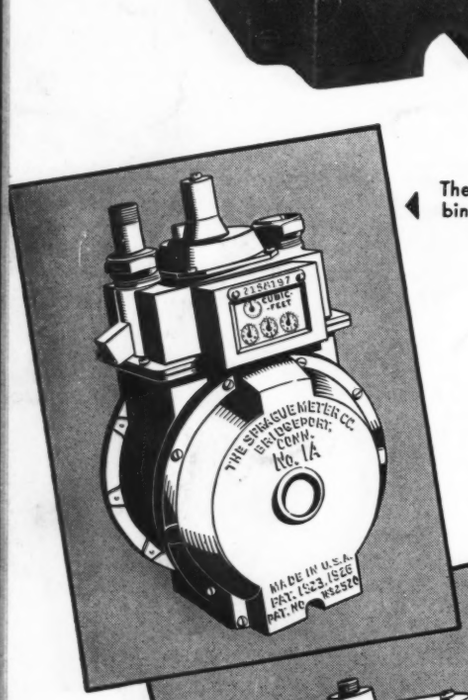
*Company*_____

Performance Counts!

Sprague's complete line of gas regulation and measurement equipment is your insurance for better performance. Precision construction, simplicity in design, interchangeability and safety are Sprague policies and ones which Engineers recognize today when streamlining their installations. For domestic or industrial use, Sprague is equipped to furnish your every need.

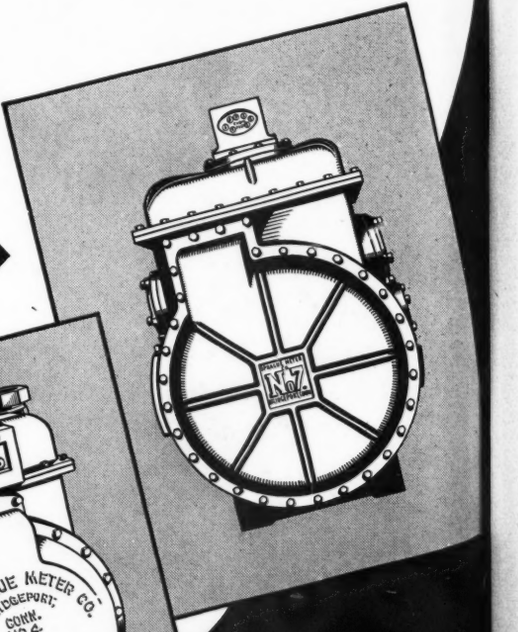
●

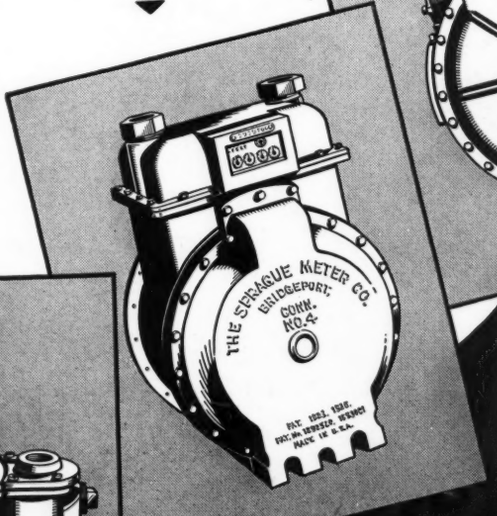
Be sure you know the advantages of the Sprague complete line.



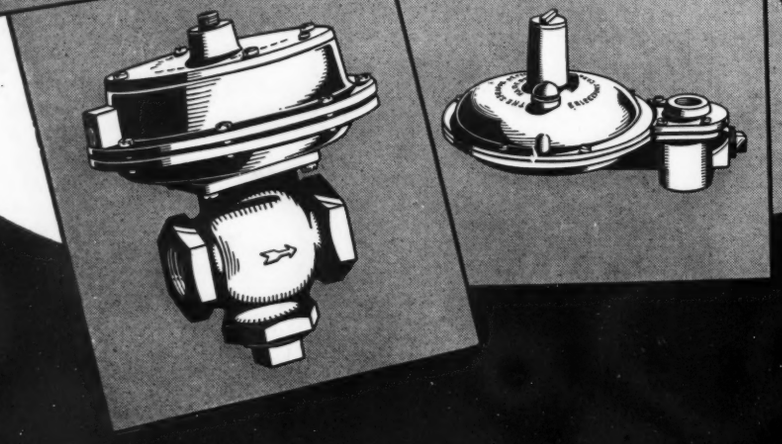
The Sprague Combination Meter and Regulator

Sprague Large Capacity Meters for Industrial Use

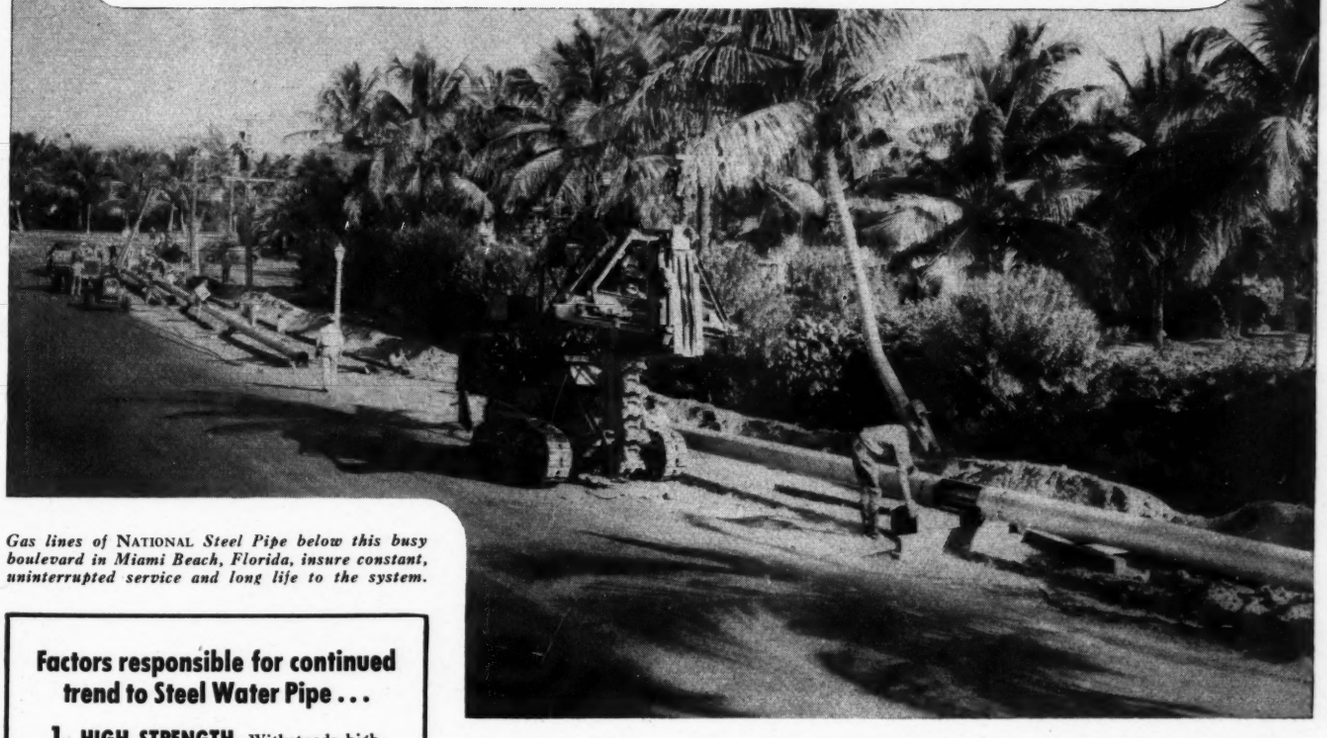




Sprague Low and High Pressure Regulators



MIAMI BEACH installs NATIONAL "Shatterproof" steel pipe



Gas lines of NATIONAL *Steel Pipe below this busy boulevard in Miami Beach, Florida, insure constant, uninterrupted service and long life to the system.*

Factors responsible for continued trend to Steel Water Pipe . . .

1. **HIGH STRENGTH.** Withstands high pressures, heavy trench loads, vibrations, shocks, washouts, and other emergency stresses.
2. **LONG LENGTHS.** Fewer joints per mile, faster laying, less damage to pavement.
3. **LIGHT WEIGHT.** Saves freight and trucking charges. Speeds laying. Cuts laying costs.
4. **SHATTERPROOF.** Eliminates sudden ruptures in case of fire and emergencies. Reduces property damage.
5. **SMOOTH SURFACE.** Ideal for linings or coatings, where necessary.
6. **LONG SERVICE.** Line after line is proving that Steel Pipe continues to give good service years beyond the original estimated service life.

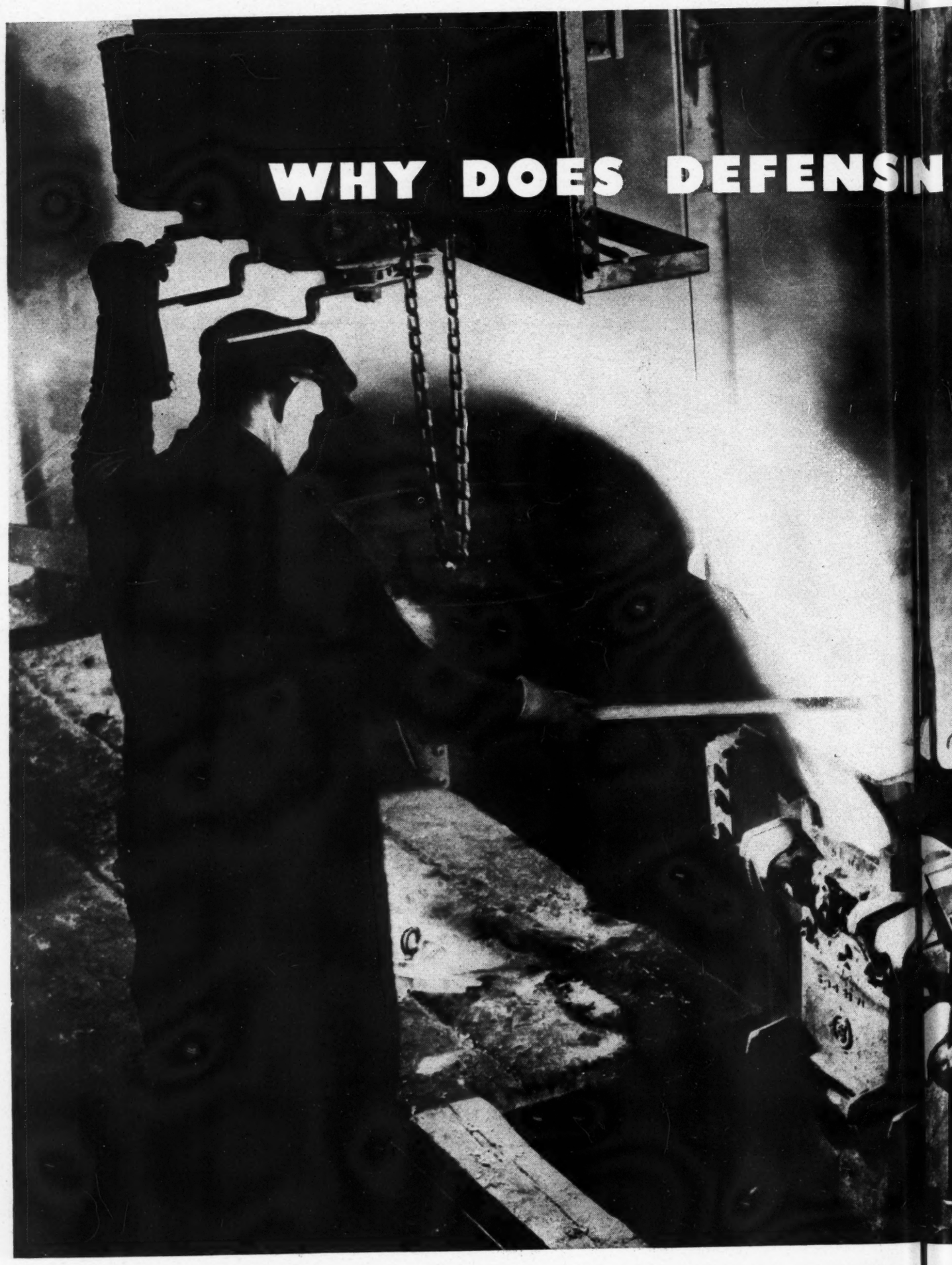
CITIES all over the country are specifying STEEL PIPE for replacements, as well as new systems. The trend is definitely to STEEL. STEEL PIPE is safer, more practical—and easier to install. STEEL PIPE is the only line material that offers dependable protection against the many uncontrollable hazards that affect present-day operating economy and efficiency of gas line systems. The high tensile strength, plus the unusual ductility of NATIONAL Steel Pipe, guards against damages due to trench pressures, shocks, cave-ins, earth settlement, heavy traffic vibrations and other external forces. NATIONAL Steel Pipe will not break or shatter. It costs less to lay because it's lighter and easier to handle. It is available in longer lengths, which means fewer joints.

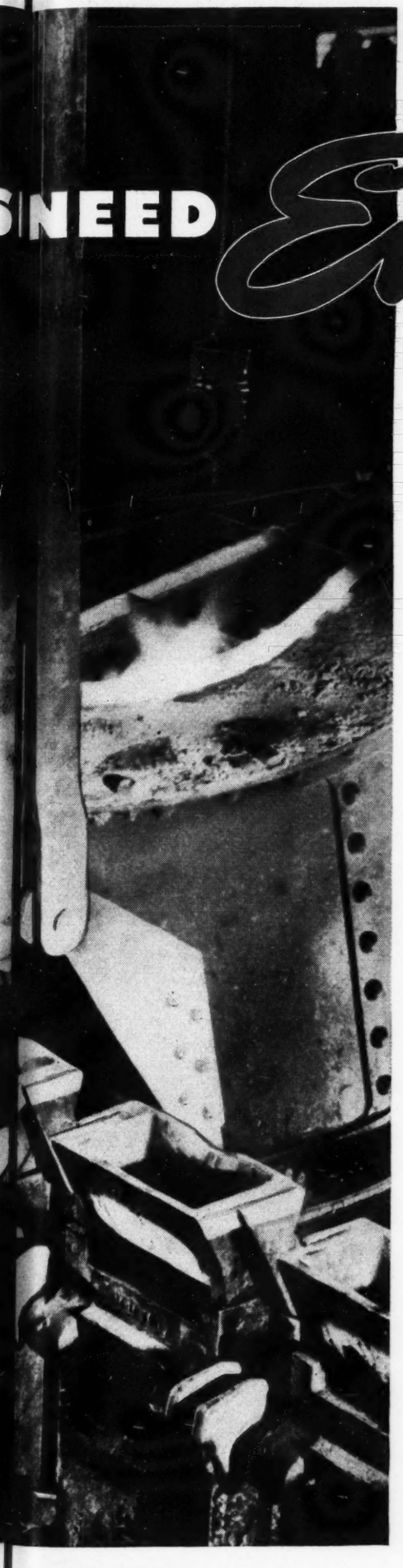
NATIONAL TUBE COMPANY

PITTSBURGH, PA.

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* — United States Steel Export Company, New York

UNITED STATES STEEL


WHY DOES DEFENS



SNEED *Everdur?*

Your steadily mounting regard for this unique copper-silicon alloy is the best answer . . . Uncle Sam, like you, wants its advantages of corrosion resistance, strength and toughness at economical cost!

Filling defense orders for Everdur* is just about a full time job. The properties you have found so useful have also made a hit with defense chiefs, especially for naval work . . . with the result that the demand for Everdur is at an all-time peak.

Should you face delays in obtaining Everdur equipment, here's the reason: the metal is not only being used in large quantity by war-vital chemical plants, but also for fuel lines on airplanes . . . for non-magnetic pilot houses on naval craft . . . for bolts and screws in hundreds of ships' hulls . . . and for many other defense applications where Everdur serves best because of its strength, corrosion resistance, weldability and high endurance limit.

* * *

We are making more Everdur copper-silicon alloys than ever before. But due to the Defense Program, copper is under strict priority and allocation control, and the availability of Everdur for civilian needs is accordingly restricted. In the future, however, this unique alloy will assuredly find ever-widening fields of usefulness.

*"Everdur" is a trademark of The American Brass Company, registered in the U. S. Patent Office. 41169A

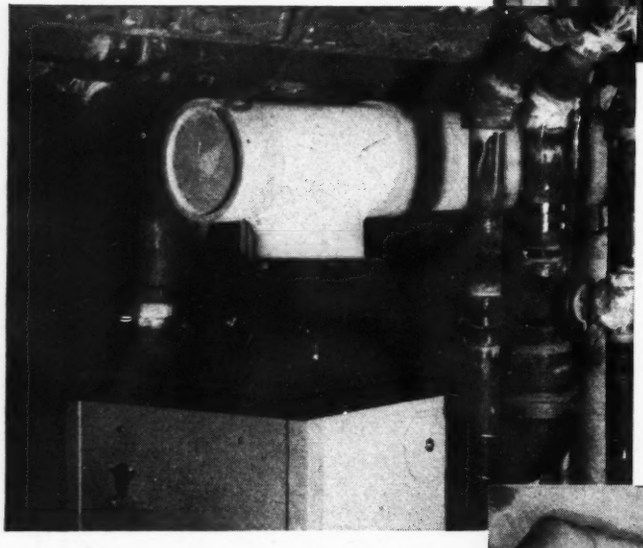
ANACONDA
from mine to consumer

Everdur COPPER-SILICON Metal

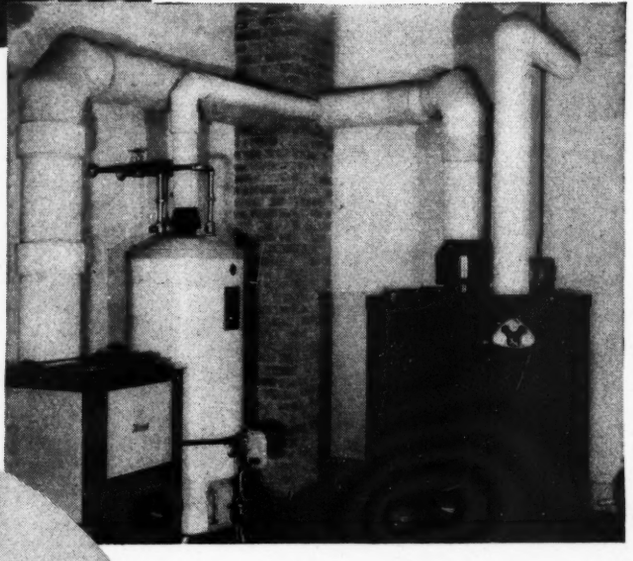
THE AMERICAN BRASS COMPANY—General Offices: Waterbury, Conn.
Subsidiary of Anaconda Copper Mining Company
In Canada: ANACONDA AMERICAN BRASS LTD., New Toronto, Ont.

EASILY INSTALLED

CANNOT RUST



NEAT AND ATTRACTIVE



JOHNS-MANVILLE JM PRODUCT

Johns-Manville
TRANSITE FLUE PIPE
For venting gas-burning appliances

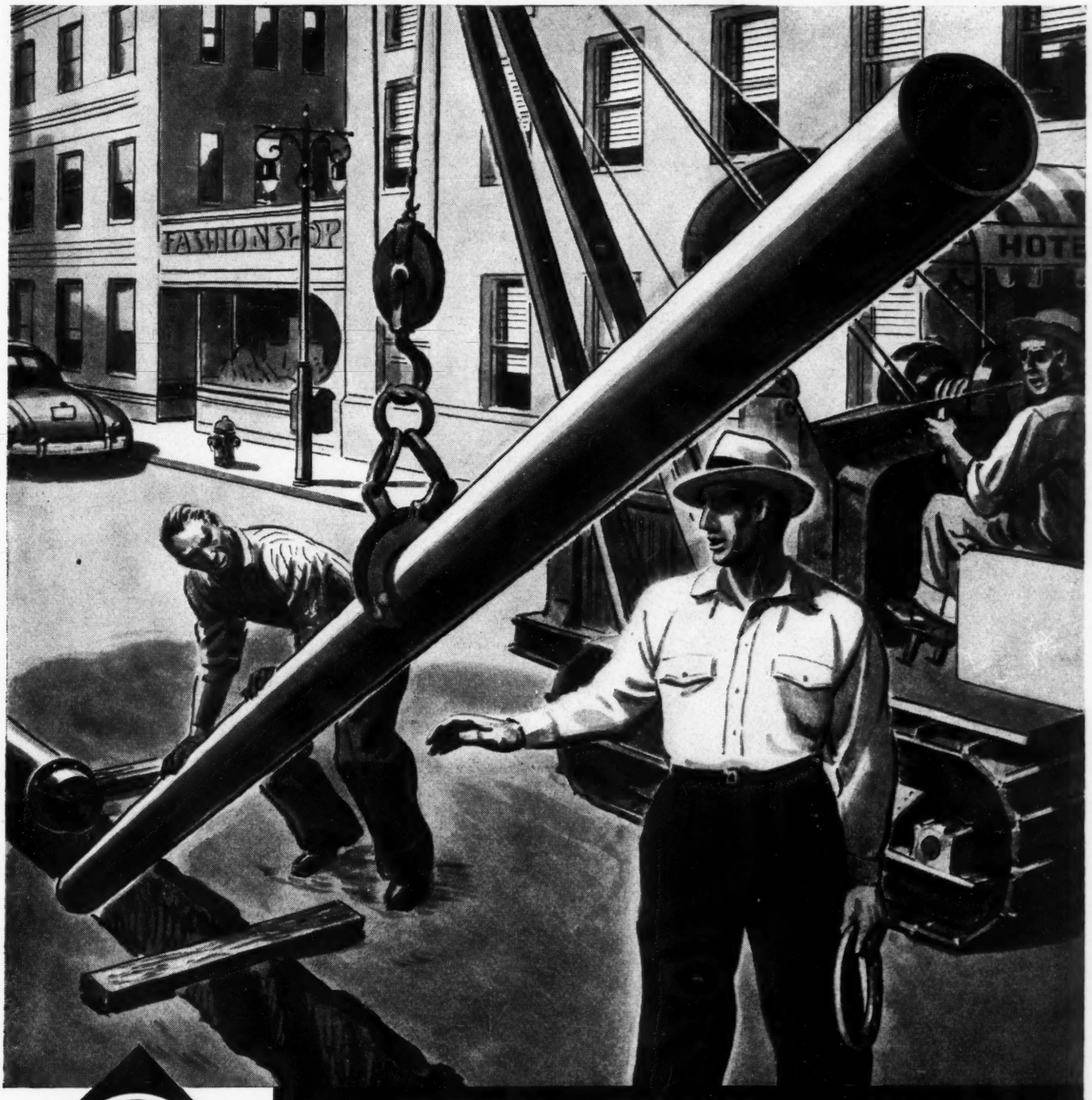
MADE OF ASBESTOS AND CEMENT, J-M Transite Flue Pipe is being widely used for venting heating systems in housing projects as well as in private homes. For full details, write for brochure TR-13A. Johns-Manville, 22 East 40th Street, New York, N. Y.

IT'S J&L PIPE

to be forgotten and yet remembered

When a gas main of J&L seamless or welded pipe is laid in a city street you can forget it as far as maintenance troubles go. But you will remember the goodwill that a J&L main helps to build for you among citizens who dislike their streets continuously torn up. And you will remember the long, safe years of low-cost service you get. J&L pipe, manufactured of Controlled Quality steel, has high tensile strength and elasticity to withstand ground movement and traffic vibration.

It will pay you to investigate the special sales engineering service J&L gives on gas main projects and installations.



J&L PIPE

J&L TUBULAR GOODS FOR THE GAS INDUSTRIES

Integral-Joint Drill Pipe • Welded and Seamless Casing, Tubing, Drive Pipe and Drill Pipe
Bell and Spigot Casing • Line Pipe • Standard Pipe
Seamless Steel Boiler Tubes • Permalined (cement-lined) Pipe

JONES & LAUGHLIN STEEL CORPORATION

AMERICAN IRON AND STEEL WORKS PITTSBURGH, PENNSYLVANIA

J&L — PARTNER IN PROGRESS TO AMERICAN INDUSTRY

THE UNIVERSAL STORY OF

CONTROLLED COOKERY ASSURES

Satisfied Customers

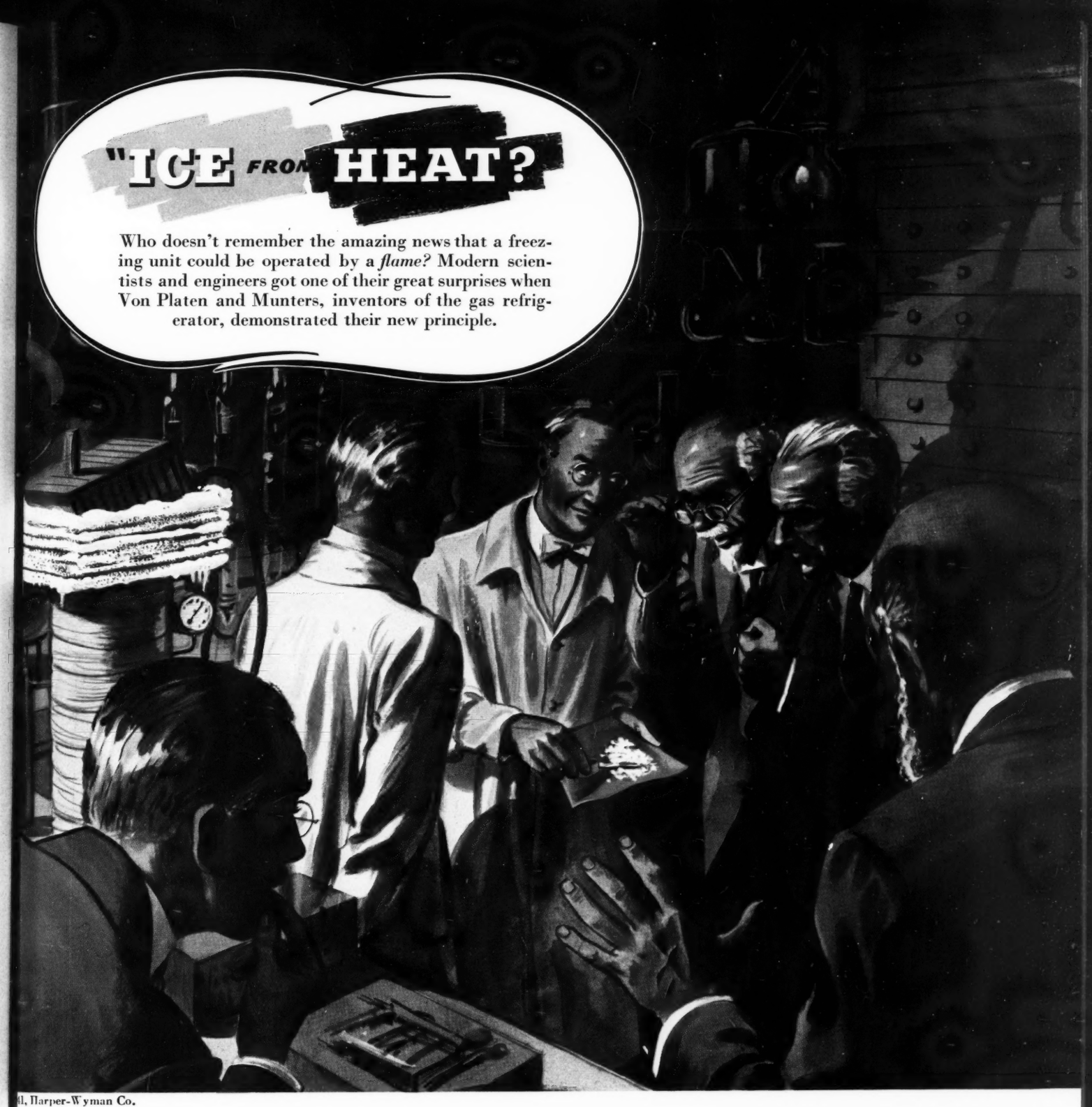
Tomorrow's Finest Salesmen

★ The modern Universal Gas Range offers automatically controlled cooking performance, assuring the utmost convenience in every type of cooking. A Universal Gas Range in the home brings to the consumer a new conception and deeper appreciation of the inherent merits of gas fuel . . . The outstanding economy ——the complete flexibility——the extra convenience of gas are all emphasized in the service rendered by the modern Universal Gas Range.

Telling the complete *Universal Story of Controlled Performance* at the point of sale assures you that each purchaser will fully appreciate all of these conveniences—that she will be resold on the advantages of your fuel each time she uses her Universal Gas Range —and that she, as one more satisfied customer will continue to be your finest salesman.

CRIBBEN & SEXTON COMPANY

MANUFACTURERS OF UNIVERSAL GAS RANGES ☆ 700 N. SACRAMENTO BLVD., CHICAGO


"ICE FROM HEAT?
Who doesn't remember the amazing news that a freezing unit could be operated by a *flame?* Modern scientists and engineers got one of their great surprises when Von Platen and Munters, inventors of the gas refrigerator, demonstrated their new principle.

41, Harper-Wyman Co.

Nothing convinces like demonstration

MANY sales-managers agree that the gas industry needs constructive *showmanship* to prove the superiorities of gas to the public. And what "show" is so productive as a demonstration of the Harper Burner System?

Here is the finest cooking unit ever engineered. Harper's "2 burners in 1" combine a speedy STARTING BURNER with a small, independent COOKING BURNER... both controlled by the same handle. The COOKING BURNER continues the cooking with just the right amount of fuel —no waste. No other burner in the world can say as much!

Connect a Harper-equipped range to gas—and *demonstrate* it! Nothing else offers such conviction that "Gas does it best."

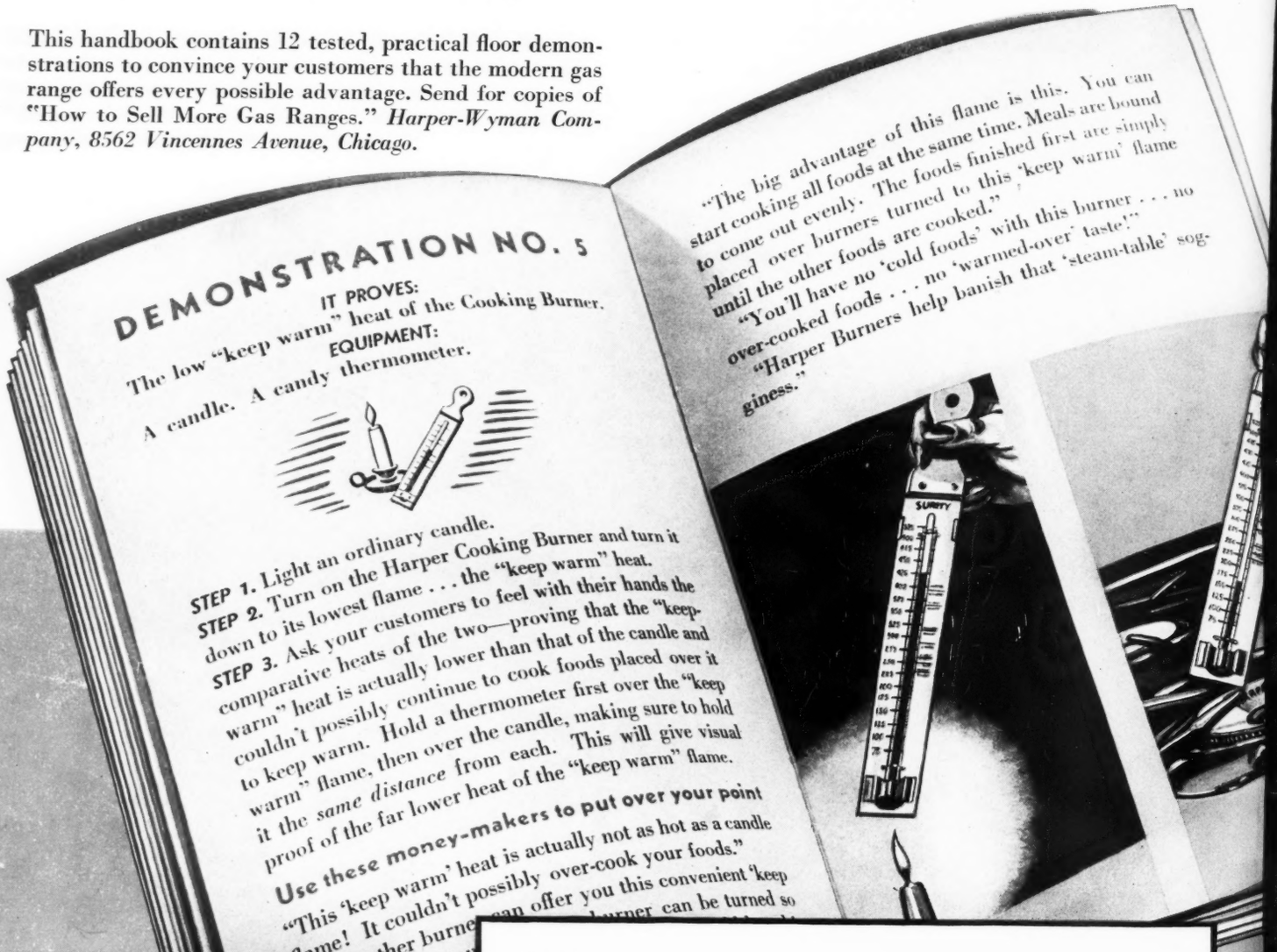
DEMONSTRATES THAT "GAS DOES IT BEST"

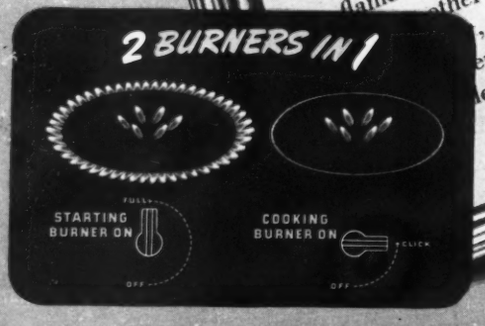
HARPER
BURNER SYSTEM

TURN THIS PAGE FOR PROOF THAT DEMONSTRATION PAYS...

This FREE *48-page handbook will help you sell more gas ranges...*

This handbook contains 12 tested, practical floor demonstrations to convince your customers that the modern gas range offers every possible advantage. Send for copies of "How to Sell More Gas Ranges." *Harper-Wyman Company, 8562 Vincennes Avenue, Chicago.*


DEMONSTRATION NO. 5
IT PROVES:
The low "keep warm" heat of the Cooking Burner.
EQUIPMENT:
A candle. A candy thermometer.
STEP 1. Light an ordinary candle.
STEP 2. Turn on the Harper Cooking Burner and turn it down to its lowest flame . . . the "keep warm" heat.
STEP 3. Ask your customers to feel with their hands the comparative heats of the two—proving that the "keep-warm" heat is actually lower than that of the candle and couldn't possibly continue to cook foods placed over it to keep warm. Hold a thermometer first over the "keep warm" flame, then over the candle, making sure to hold it the *same distance* from each. This will give visual proof of the far lower heat of the "keep warm" flame.
Use these money-makers to put over your point
"This 'keep warm' heat is actually not as hot as a candle flame! It couldn't possibly over-cook your foods."
"The big advantage of this flame is this. You can start cooking all foods at the same time. Meals are bound to come out evenly. The foods finished first are simply placed over burners turned to this 'keep warm' flame until the other foods are cooked."
"You'll have no 'cold foods' with this burner . . . no over-cooked foods . . . no 'warmed-over' taste!"
"Harper Burners help banish that 'steam-table' sogginess."
SURETY



The Harper Burner System operates on the unique principle of a burner within a burner, "2 burners in 1", both controlled by the same handle. The small COOKING BURNER *operates independently of the* STARTING BURNER. *No other burner in the world offers this advantage.*

"When the Harper Burner System was developed and made available on Detroit Jewel Gas Ranges, it gave us one of the most remarkable and convincing sales demonstrations we have ever used.

"We believe there is no substitute for demonstration to give customers a convincing picture of top burner cookery. Our salesmen realize the importance of proving their sales arguments, and the Harper Burner System gives them the visual proof they need to back up their story of the 'saving in time, fuel and food' on these modern Detroit Jewels."

(Signed) **V. C. Ericson**
Adam, Meldrum & Anderson Co.
Buffalo, N. Y.

Proof That Demonstration Pays

HARPER BURNER SYSTEM

—one of the standards of top burner performance under